A META-ANALYSIS OF THE RELATIONSHIP BETWEEN GIFTEDNESS AND

LIFE SATISFACTION

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ABSTRACT

The focus of this paper is the quantitative synthesis of findings in selected literature on longitudinal gifted studies using 'meta-analysis.' In the existing literature there is a plethora of conflicting findings regarding occupational and life satisfaction of gifted individuals. Thus, a meta-analysis investigated the integration of the statistical results of these divergent findings. Nineteen studies were analyzed. The resulting 41 statistical results were transformed into a common effect size measure (ES), correlation coefficient. Using Validity Generalization Methodology, the corrected mean effect size for the relationship between giftedness and satisfaction was .14. When life and occupational satisfaction were separated into two separate effect size estimates, life satisfaction had a corrected mean ES of .10, and occupational satisfaction had a corrected mean ES of .19. No significant difference existed between men and women participants. The relationship of these two measures with giftedness was dependent on a number of variables. In order of strength they include: location of sample studied, location of sample drawn, and gender and age at time of study. Additionally, special school programs for gifted individuals had a mean effect of .10 and a standard deviation of .1. The implications of these findings are discussed in terms of current theories of intelligence and suggestions for further educational investigations are addressed.

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CHAPTER 1

INTRODUCTION

Assessing the relationship between giftedness and life satisfaction

Society looks upon gifted children as a valuable resource that should be nurtured. As such, investigating whether gifted individuals actually live up to their potential both for society and themselves has produced much confusion in the literature.

Large scale investigations of the gifted began in the 1920s with the research of Lewis B. Terman (1925). Terman, utilizing the 1915 version of the Stanford Binet, identified and studied about 1500 gifted children in California. He and his protégés continued to investigate these children throughout their lives or until their withdrawal from the study (Sears, 1977; Terman & Oden, 1947, 1959), thus providing a profusion of carefully categorized, dissected, and referenced information

on gifted individuals. Terman's study became the longest running research project on the gifted ever to take place.

The Problem

Terman (1925) painted gifted individuals as happier, better adjusted, physically more attractive, socially more aware, and generally more successful than the average individual. Although many of these individuals were reasonably successful at school and in their early adulthood, findings related to satisfaction with their lives has not been consistent (Feldman,1984, Rimm, 1987). Sears (1977) reported that gifted individuals have more positive life and vocational satisfaction. They achieve more income, are more likely to have professional careers, and come from gifted family backgrounds. In contrast, other longitudinal studies have found that gifted children are frequently described as "difficult" and lacking in motivation (Freeman, 1991). Additionally, Feldman (1984) found that the higher the IQ (180+) the less likely that the individual would show any significant gain in life's successes, over individuals deemed not as highly gifted (135-150 IQ). Some of the gifted with IQs registering over 180 reported feeling little life or occupational satisfaction (Feldman, 1984).

There is confusion in the literature concerning the relationship between sex and giftedness. Walker (1992) indicated that gifted women feel equal satisfaction

with their careers and home life. Others feel gifted women don't feel a sense of satisfaction unless they perceive themselves as instrumental or assertive in their careers (Hollinger, 1992). Additionally, for women, Hollinger (1988) observed that social expressiveness was related to neither general life satisfaction nor career satisfaction. Rodenstein (1978), on the other hand, found friends and feelings of participation in society of paramount importance in a gifted woman's life satisfaction level. Certainly, social changes over the past 50 years have affected women's perceptions and expectations in life. However, many of the studies such as Rodenstein and Hollinger were done in the past 20 years and produce more controversy than actual solutions.

For men, Sears (1977) showed income as a major antecedent of occupational satisfaction during their early years. Other researchers have found that men's principal source of satisfaction came from the type of work followed by their children and immediate family (Oden, 1960; Subotnik 1988). Oden (1960) stated that the type of work was the principal factor for a gifted individual to feel both occupational satisfaction and life satisfaction.

Research into differences between men and women has likewise led to varying results. Oden (1960) found men to be generally more satisfied than women. Holahan (1985) demonstrated separate levels of satisfaction dependent on

whether one was studying occupation or life. Many of these results are based on conjecture and small sample sizes, and were more qualitative and observational than statistically oriented.

Contrary to some of Terman and Oden's (1960) early findings, that gifted children live up to and exceed their tested abilities, findings of the US National Commission on Excellence in Education (1984) concluded that more than half of the gifted children in the US do not perform up to their tested abilities. Although some may improve with time and maturity, many will continue to underachieve, suffering from low self worth and general lack of motivation (Rimm, 1991; Wellington, 1963). Given this myriad of conclusions, juxtaposing the results into a systematic quantitative procedure such as meta-analysis may help identify and categorize the innumerable variables that affect the results of any one given study.

Specialty Programs for the gifted

The most productive method of teaching the gifted population and providing them with a positive outlook and a sense of long term life satisfaction has long been an issue for debate. As far back as the 1920s efforts were made to provide gifted individuals with a positive school experience during their formative school years (Subotnik, 1988). Many programs, acceleration and the like, claimed benefits for

their pupils. Unfortunately, few schools lasted beyond their creators and as a result their long term efficacy continues to be controversial (White, 1987).

Schools such as the Speyer School in New York opened their doors in the mid 1930s (lasting only 5 years). Shortly after the opening of the Speyer School for the gifted, University of Toronto Schools (UTS) in Toronto welcomed specially identified gifted students. Unfortunately, for many of these programs there was little long term follow-up. And those students that were tracked for a period of time after leaving their programs revealed varying amounts of life satisfaction (Janos, 1987; White, 1987). Furthermore retrieving the statistical data from many of these old school programs was complex although there were many anecdotal reports available.

More recently, other gifted programs have been implemented in both Canada and America and their efficacy remains in doubt due to the lack of long term follow up. These programs include the Hunter School for the gifted, Project Spectrum (based on Gardner's multiple intelligence theory), Project Choice, the Wolfson Program, specialty gifted private schools, pull out classes and acceleration programs to name a few (Subotnik, 1988; Sheilds, in press).

In summary, the study of the life satisfaction of the gifted has included many variables that are unique to each of the studies and these variables may be

responsible for some of the deviation across the study results. Furthermore much of the research has been based on the difference between the sexes and differences of life satisfaction at various ages. Many of the gifted schools structure their programs on conflicting theories of intelligence (Hollinger, 1992; Swiatek, 1991). Additionally the method of identifying a gifted individual varies immensely across studies. While some studies classified the gifted using various theoretical perspectives such as the Triarchic theory of intelligence or Gardner's Multiple intelligence theory others used practically based nontheoretical achievement oriented measures. Other variables include location of the population from which the sample is drawn and length of time from original identification to follow-up life satisfaction study.

The application of meta-analytic procedures as defined by Hunter and Schmidt (1990) (adjustments) may resolve some of the controversy of the relationship between life satisfaction, giftedness and special school programs for the gifted. Unlike other meta-analytic procedures that correct only sampling error, Hunter and Schmidt consider two other major problems that may create variation across studies: range variation (restriction in range, such as in the gifted population) and error in measurement. Thus, it will be possible to differentiate between the variation in results across studies due to artifacts and the variation across studies due to the many moderating variables inherent in each study.

Moderating variables, as described by Hunter and Schmidt, are any characteristics in a given study that may be of interest or effect the study results.

Research Questions

In an attempt to resolve some of the differences found about gifted individual's satisfaction, research has been done using multiple approaches. Many of the studies were discarded for the purpose of this meta-analysis because they use individual case study methods; others are qualitative and anecdotal or simply espouse a theory. Some are impressionistic and lack basic good experimental design. Still others utilize sample sizes that are too small and needed more specific detail. Many studies do fulfill the criterion of well-documented research and form the basis of two major questions that are investigated using meta-analytic procedures.

The present study addressed the following questions.

A: To what extent are gifted individuals living up to their own expectations or that of society's? What is the average magnitude of that relationship? Is this relationship consistent across variables?

B: Have special gifted schools or programs produced any long term gains or effects for gifted children? What is the magnitude of this relationship?

<u>*Scope of this Study*</u>

Meta-Analysis

To make sense of the many contradictory findings in the area of giftedness and life satisfaction, a need arose for some type of integrative model. It was important for the model to incorporate a logical procedure for consolidating study data. So that it could provide information about variables that might affect and create discrepancies across study results. Such a method for integrating data on imperfectly measured constructs such as intelligence became available only over the past 12 years, with the work of Hunter and Schmidt (1982). Prior to this, review literature was predominately of a qualitative or subjective nature. These subjective or qualitative patterns in reviews produced more questions than answers. Conclusive proof of many research questions was impossible to attain and, as a result, government policies in education on the gifted were not implemented as there was little consensus on important issues.

In 1976, Glass noted that hundreds of studies accumulate over a period of a few years and that these studies collectively contain more information than we have been able to extract from them to date. Glass stated, "We know much less than we have proven" (Glass cited in Hunter & Schmidt, 1982 p.34)

In essence, what was needed was not more primary research but a method of making sense out of the existing vast amounts of data that had accumulated. This is the purpose of the meta-analytic approach.

To begin the process of a meta-analysis, it is necessary to first categorize the data, then organize, integrate and finally interpret it by way of a mathematical model. Meta-analysis, then, is a comprehensive quantitative method used to objectively integrate findings across study results.

Meta-analysis has been used extensively in the physical sciences for some time. According to the research of Hunter and Schmidt (1990), meta-analysis has produced evidence that the culmination of data in the behavioural sciences is as good as in the physical sciences. Hunter and Schmidt (1990) found that extreme results (outliers) discarded in such areas as physics are not as likely abandoned in the behavioural or social sciences. In other words, sometimes extreme results may find their place in the design of a theory in the behavioural sciences and conversely in the physical sciences they would simply be discarded.

Changes in all the sciences are taking place as a result of meta-analytic procedures. Unnecessary replication of primary research may slowly cease to be. The process of cleaning up and making sense of literature not only serves to clarify

and elucidate theories but, it also demonstrates the focus further research should take.

Sources for Meta-analytic Studies

Meta-analytic procedures are done on any number of studies that have variables that a researcher is interested in investigating. These studies or papers may include qualitative type research, studies with experimental and control groups, short term studies and longitudinal research. Additionally, utilizing already completed meta-analytic studies and adding them to existing research is fruitful.

Computer retrieval services such as those in University libraries can now locate studies, reviews and dissertations throughout the world. These can now be translated and included in the meta-analytic process, thus providing a plethora of findings on any number of issues, such as the life satisfaction of gifted individuals.

Social Science Citations are frequently used. This system permits a search forward from the key article. For example, after an article has been published a list of key articles that have cited that article is listed in the Social Science Citation

Index. These more recent studies may have replicated existing research or studied aspects similar to the primary research.

Other areas or sources of material include searching through existing article bibliographies and querying specialists in the field either by mail or by computer E-mail.

Meta-analytic Methodologies Employed

To begin with, meta-analysis requires that only results that are of interest to the examiner be included in the study. These statistics are then extracted from the results section. The data removed from the individual studies varies from means and standard deviations to highly sophisticated statistical formulas. Additionally, the researcher records information pertaining to sample size, sex, age, birth location, geographical locationat time of study, source, and length of investigation. These artifacts are limited only by the number of moderating variables in a study. By categorizing these moderating variables from a multitude of studies, it may be possible to see why these findings have varied so much across studies. Thus it is important that any moderating variable in the methodology that is relevant to the investigator's hypothesis be recorded.

Next, all of the statistics are converted to a common effect size estimate using one of the many formulas available. For the purposes of this paper, formulas for conversion to a common effect size were derived from Hunter and Schmidt (1990) and Rosenthal (1991). These formulas convert the results to the common effect size estimate " r ". This " r " represents the relationship between the two variables of interest, life satisfaction and giftedness. There are other methods of conversion to common effect size estimates; however most deal with significance levels and tell nothing of the magnitude of the effects (Cohen, 1976; Glass, 1976; Hedges, 1981). Additionally, Hunter and Schmidt (1990) and Rosenthal's (1991) formulas were chosen because they are used best in procedures where it is of interest to study the degree of a relationship between two variables.

Following the conversion to common effect sizes and an initial inspection to to see if there are any outliers, Hunter and Schmidt (1990) recommend that adjustments to the effect sizes be made when:

1. Population sizes are significantly unequal in the groups studied.
2. The measure used in the identification of giftedness or life satisfaction is not perfect.
3. The various measures used in the identification of the population have different reliabilities.

(For a more complete list of possible study artifacts that affect or alter effect size estimates see Hunter and Schmidt, 1990, p: 45.)

Outliers

Following the conversion of the individual studies to common effect sizes those studies that may contain bad data should be thrown out. If the bad data could be found, it could be removed. However the only way to identify bad data is to remove effect sizes that are far so out in the distribution that they are obviously outliers. For the purposes of this paper, outliers were removed when the results were ± 3 standard deviations outside of the distribution. Unfortunately, outlier analysis only works when study sample sizes are moderate to large. If the sample size is small, it may be impossible to determine whether they are true outliers or result from sampling errors.

The next step requires comparing the adjusted effect size estimates across results. If little difference is observed in effect sizes, then depending on the direction of the relationship, the hypothesis that a negative or positive relationship exists between the two variables may be logical. If the adjusted effect size estimates still have a huge discrepancy, then it is important to examine some of the many moderating variables, such as age, geographical location and construct identification methods. Additionally, if little or no difference exists after the adjustments are made it may still be important to observe some of the moderating variables. Stronger or weaker relationships may exist under certain situations. For

example, gifted girls attending special schools demonstrate a slightly more positive effect size than the rest of the sample. This may have special implications for educating girls in the future.

It is important to recognize the limitations of any meta-analysis. Certainly any attempt to acquire or have a totally exhaustive search of the literature is impractical. Translations are not always available, nor are the methodologies used in the social sciences flawless and fully interpretable. Likewise,not all statistical results are readily translatable into common effect size estimates. In this study, the statistical results of a McNemar's "Q" could not as yet be converted to a common effect size. Finally, decisions to include or exclude data are subject to personal judgments that may in and of themselves be biased.

In summary, meta-analysis is a suitable method of systematically integrating existing findings on the life satisfaction of gifted individuals into a coherent summary. This could provide answers to pertinent questions and certainly help clarify the numerous theories and findings that have been in contention for many years.

CHAPTER 2

BACKGROUND LITERATURE

This chapter is a review of the current theories of intelligence pertaining to the identification of gifted individuals. These theories follow a time line from the genesis of the construct to the measurement methods available and commonly used today. Included will be a discussion of some of the problems inherent in the current methods of identification and how this relates to the innumerable schools and programs available to teach the gifted.

The subsequent discussion relates to the topic of life satisfaction of the gifted. Included is a synopsis of the current issues relating to life satisfaction among the gifted and the population at large. This is followed by a consideration of the various procedures used to identify satisfaction. Included is an examination of the innumerable self report measures, questionnaires and interview methods. Finally an analysis of meta-analytic procedures in integrating the disparate results in the literature on the life satisfaction of gifted individuals is presented.

INTELLIGENCE THEORIES

Introduction

Despite the plethora of research and theories espoused on the topic of intelligence, there is little consensus on the nature of giftedness. At present there is no precise agreement on its identification exist among the research establishment (Cattell, 1987; Gardner, 1983; Guildford, 1967; Sternberg, 1985).

Individuals identified as gifted frequently do not fulfill their potential in later life (Rimm, 1991). In contrast, many average students go on to be highly successful and productive individuals. History is replete with anecdotal accounts of individuals who performed inadequately during their lives but later blossomed into great world leaders. Also common are the stories of prodigies that have fizzled and unusually creative geniuses that have not lived up to their own or society's expectations. Even among the large scale gifted studies there are contradictory and diverse results on the level of success these individuals feel and achieve by there own and society's standards (Feldman, 1984; Tomlinson-Keasey, 1990).

HISTORICAL PERSPECTIVE

From early on in our recorded history, there has been many attempts to observe and accurately identify the gifted child. Various rulers and philosophers in their quest to strengthen their position and their government's. often sent out observers among the people. These scouts were not limited in their search to the lower or upper classes. Any individuals who demonstrated potential as warriors, artisans and future scientists were trained at the expense of the ruler in their fields (Colangelo and Davis, 1991; Whitmore, 1980). Although this was a highly unscientific method of identification of gifted individuals it remained intact until last in the last century.

Attempts to identify gifted or talented individuals emanated from late in the previous century. Francis Galton postulated, after being impressed by his cousin Charles Darwin's work on "**Origin of the Species**", that evolution would favour persons with keen senses. Galton attempted to measure intelligence by tests of visual and auditory acuity, tactile sensitivity, and reaction time (Colangelo & Davis,1991). From those early investigations was born Galton's research and writing on the theory of Intelligence. Although Galton's view was based solely on heredity and his original methods and findings are still in

dispute, he opened the door to the concept of measuring intelligence by testing.

Furthermore, the idea of a construct called `intelligence' was born.

OVERVIEW

Two views of intelligence currently dominate the literature and are

discussed. The first view, known as a unitary or 'G' model (General overall

intelligence), has undergone many revisions since its inception. The second view

is a theory of multiple intelligence.

'G' MODEL

The monolithic view of intelligence was first proposed by Charles

Spearman in 1904. Spearman devoted himself to the fundamental question of

whether intelligence is a single ability or whether it is a bundle of individual

unrelated abilities. Spearman, utilizing factor analysis, posited the view of a Two

Factor Theory, a 'G' and an 'S'. 'G' refers to a general or overall mental ability.

'S' refers to an ability specific to a performance.

The essence of this theory is that tasks such as abstract mathematical

processes correlate highly with other tasks requiring higher order skills, such as

vocabulary size. Lower order motor skills and repetitive tasks correlate less with the higher order ones but still positively. The fact that all abilities tend to correlate positively is, according to Spearman, evidence for a general mental capacity factor.

Lewis B. Terman, working with the original intelligence test designed by the psychologist Alfred Binet in France, reformulated, Americanized and renamed Binet's measure the Stanford- Binet (Cattell, 1987). Terman, like Spearman, accepted the view that intelligence was a single trait and as such used the Stanford-Binet as the sole source in his studies to identify the gifted.

Utilizing this method Terman proceeded to conduct the largest longitudinal study of gifted males and females. Consequently, the findings of Terman (1925) made psychological history. As a result, the Stanford-Binet became the status quo for identification, classification and placement of gifted and retarded individuals for the next 50 years. Unfortunately, it determined the fate of the majority of school age Americans during this time period (Bersoff & Hofer, 1990).

Unfortunately for many, however, the Stanford-Binet underwent little critical analysis or study of its validity. Other than the introduction of other

measures such as the Wechsler scales few changes occurred in the identification of gifted or mentally retarded children(Wechsler, 1991). As a result, history is fraught with examples of incautious interpretation of these test results (Bersoff & Hofer, 1990).

The late 1960s and early 1970s brought more than one kind of revolution. The acceptance of the S-B (Stanford-Binet) as the status quo was challenged through numerous American court cases. The famous Hobson v. Hansen case (1967) and later the Larry P. v. Riles case (1971) brought into question the validity of the Stanford-Binet and Wechsler scales. More specifically their use as the sole identifier of intellectual ability came under direct scrutiny. Factors such as the test's cultural bias, and the large discrepancies between a specific ability and a general ability, have gradually eroded its acceptance. As a result, of these problems, many theories ensued in an effort to address some of these controversial issues. The following is a discussion of the most prevalent theories.

THE TRIARCHIC THEORY OF INTELLIGENCE

Robert Sternberg proposed a theory of human intelligence, which although unitary in nature, is referred to as the triarchic theory (Sternberg, 1979, &

Sternberg, 1985). The theory evolved as a result of Sternberg's and others' disenchantment with the current status quo of the psychometric approach (Gardner, 1983; Vernon, 1986). Sternberg (1979) expressed the necessity for a definition of intelligence that went beyond what IQ tests measure. Sternberg attempted to address some of the problems with IQ such as culture bias, style and speed of processing information.

Sternberg attempted to present a holistic approach to intelligent behaviour by drawing on the previous works of Spearman (1923), Guilford, (1967) and Cattell (1971) to name a few. In this theory Sternberg endeavoured to integrate the environmental and cognitive traditions into a new view of intelligence based on a processing approach, by still continuing to endorse an overall unitary view of intelligence.

Defining the Triarchic Theory

Initially it might appear that the triarchic theory refers to three separate intelligences. In actuality, it refers to a theory that encompasses three subtheories, which serve as a basis for a model of intelligent behaviour. The triarchic theory of human intelligence comprises subtheories that contain a

Contextual portion, a Two Faceted portion and a Component portion (Sternberg, 1985).

Contextual Sub-Theory

This subtheory deals with the individual and his/her relationship with the external world. Sternberg (1985) views intelligence in context, as consisting of purposive, adaptive behaviours. Thus shaping and selecting real world situations that are relevant to one's life. Sternberg maintains that this is a 'relativistic' view. In essence, an intelligent act may differ from one person to another and change in different environmental and need situations. This subtheory of intelligence states that there is a need to study intelligence in relation to real world behaviours. Berry (1984), in his research on culturally relative concepts, identified distinct concepts of intelligence in a number of other cultures. According to Berry these concepts are specific and relevant to the 'real world' environments in which they exist. Unfortunately much of Berry's work fails under close scrutiny as the findings have not been replicable and the variables appear too numerous (Sternberg, 1985).

Two Faceted-Subtheory

Cattell (1971), Horn (1968), and Sternberg (1981) have all proposed the idea that intelligence is a measure of an individual's ability to deal with a novel situation. Thus, according to this sub-theory, a gifted person can first utilize selective encoding and decide whether an issue is worthwhile, then combine the information selectively to produce something novel or insightful. Finally, they can make selective comparisons with old information and relate that knowledge to the new information and decide whether all or some of the information is worthwhile. In contrast, a non-gifted individual would not do this transformation as quickly or efficiently.

Sternberg (1985), however, proposes a second aspect to this novel situation. Sternberg considers that intelligence is also dependent upon a person's ability to automatize information processing. When information is new it takes up a great deal of one's higher processing or global resources and requires one to utilize every available aspect of one's conscious global resources. A gifted individual can transfer information to other more local processes quickly and efficiently. Practically speaking, it is like learning to drive. At first it is necessary to use all of one's intellectual resources to concentrate. However, after a specified time period, depending on one's intellectual ability, one does not need to

concentrate on all aspects of driving. One is free, within reason, to do other things. Vernon (1991) found in his work on the study of novelty, evidence for a change in processing style in diverse populations when there were increasing processing demands.

The Componential Sub-Theory of Intelligence

According to Sternberg (1979), a component is an elementary information process that operates by internal representation of objects or symbols. The component translates sensory information into a conceptual representation and then into a motor response. These components have specific properties which Sternberg describes as being measurable. Sternberg refers to three subcomponents necessary for intelligent behaviour to occur. These are metacomponents, performance components and knowledge acquisition components.

Metacomponents are used to plan, monitor and evaluate problem solving and decision making. Performance components are processes used to solve problems. Knowledge acquisition components are processes used in the gaining of

new knowledge. Research by Hunt (1980), with extreme groups (upper and lower ends of the IQ continuum), indicated the need for metacomponents or resource allocators in the thinking process. Hunt's works supported the notion that intelligence is related to attentional resources. Gifted individuals use different methods, such as grouping items, to process information dependent upon the requirements of the task.

Integration

By adding another dimension to the original Unitary view of intelligence, Sternberg (1985) endeavours to answer many of the criticisms directed at the WISC, WAIS and Stanford-Binet. Specifically, Sternberg argues for the processes of execution rather than the product in the triarchic theory. Additionally, by introducing a contextualist perspective into the theory he provides a rationale for differences in IQ results across cultures. This is probably the key development in Sternberg's theory over previous views.

In summary, this theory is an attempt to integrate a cognitive and environmental tradition into a cohesive view of intelligence. The theory is best described as an information processing model that is serial in its approach. Triarchic theory attempts to integrate and build on many of the traditional

existing views of intelligence such as those of Cattell, Guildford and Spearman. Attempting to condense all of these previous viewpoints gives rise to very large and convoluted Triarchic theory. Additionally the task of fashioning methods of evaluating an individual's giftedness remains a complex issue.

MULTIPLE INTELLIGENCE THEORY

In reviewing the genesis of multiple intelligence theory in the identification of the gifted, one can distinguish several researchers responsible for its evolution.

The origins of this theory are traced to the writings of Binet who postulated a multifocal view of intelligence. Unfortunately Binet was not considered a theoretician and so the idea of more than one separate intelligence died with him. Spearman (1927) investigated the possibility of multiple intelligence but his mathematical model concluded that there existed a single unitary 'G' called intelligence.

The next major advocate to the multiple intelligence view was Guilford (1967) he postulated a multitude of intelligence. He presented these as a matrix.

The theory presumes there are five separate matrices or abilities and each contains 24 cells. Each of these cells represents a factor. Each of these factors represents a specific combination of abilities related to the overall matrix. For example, if 'cognition' is one ability, then a factor (designated by the three letter 'trigram'), might read 'CBU' (Cognition of behavioural units). Guilford designed or used various existing tests to authenticate the theory through the various developmental ages at which these factors occur. Furthermore, corroborating evidence produced by Stott and Ball (1963) of the emergence of these factors at ages lower than one year provided Guilford with proof of his model.. These concepts are fully explored in Guilford's (1967) 'The Nature of Intelligence',.

In contrast Cattell (1987) in reviewing some of the factors identified by Guilford, such as the relationship of the flexibility factor to temperament, provided inconclusive evidence for the existence of this relationship. Although Guilford's theory gained widespread recognition in the late 1960s, it raised many questions and a satisfactory measurement method to identify the gifted was never found. Since then, many multiple intelligence theories have been proposed; few have met with unanimous agreement within the research community. One theory that has gained much support in recent years is Gardner's theory. According to Gardner (1983), his theory is an attempt to simplify and solve many of the dilemmas created by both the original 'G' theory and the early multiple intelligence theories. Of special interest here is that this is the first theory to

consider internal personality variables as conceivable prerequisites to human intelligence.

GARDNER'S THEORY OF MULTIPLE INTELLIGENCE

Gardner (1975) published a book based on his observations of gifted and neurologically impaired individuals. After years of studying these individuals Gardner (1983) concluded that there are separate domains of intelligence.

Gardner (1983) defines intelligence as,

An ability or set of abilities that permit an individual to solve problems or design products that are utilized in their particular culture or environment. (p.60).

This theory suggests that human cognitive competence is a set of talents, abilities or mental skills known as intelligence. Gardner (1983) argues that intelligence, ability and domain all represent the same thing and thus the terms are interchangeable. Furthermore, cognitive psychologists argue that processing occurs in a serial manner, in which one stage of processing follows the other (Lohman, 1989). The multiple intelligence viewpoint suggests that thinking

requires parallel and serial processing. Lohman (1989), describes Gardner's

theory as

> A richly interconnected hierarchy with parallel-processing modules at
>
> the base that are dedicated to particular sensory inputs or response
>
> systems and a serial, limited capacity system at the apex to model
>
> higher order thinking (Lohman, 1989 p.).

The MI theory demonstrates a shift away from dependence on information

processing, to a reliance on a knowledge based system. MI theory focuses on the

cultural and developmental determinants that effect intelligence, accordingly

creativity in each domain is the highest level of functioning one can achieve.

Gardner hypothesizes that intelligence is a profile of an individual's strengths

and weaknesses across seven separate domains or abilities. These Seven domains

include; 1. Linguistic intelligence, 2. Logical-mathematical intelligence, 3. Spatial

intelligence, 4. Kinesthetic intelligence, 5. Musical intelligence, 6. Interpersonal

intelligence, and 7. Intrapersonal intelligence.

Linguistic Intelligence

Linguistic Intelligence is the easiest of the seven domains to identify and

define. According to Gardner, linguistic intelligence refers to one of the two

domains measured by psychometric testing (Gardner, 1985). In the WISC-111,

this would include the five subtests that make up Verbal Ability.

Logical-Mathematical Intelligence

Logical-mathematical intelligence is the ability to utilize various

numerical configurations and calculations and to create useful notations

(Gardner, 1983). Gardner divides mathematical intelligence into an inventory of

subcomponents: deductive reasoning, inductive reasoning and computation. This

aptitude has been the subject of a considerable amount of investigation and like

linguistic intelligence it is identified by the Standard IQ tests. According to

Gardner, the skills in linguistic and logical mathematical intelligence are the

skills most valued by the academic community.

Spatial Intelligence

MI theory states that Spatial Intelligence entails the capacity to represent

and manipulate spatial configurations (Gardner, 1983). Porath (1988) found

evidence in gifted individuals of domain specific spatial intelligence. She studied

neo-Piagetian developmental levels across the domain of spatial-artistic

cognition. Porath found that the gifted children demonstrate thinking that was

independent of a general/structural analysis. These findings suggest that developmental differences tend to be domain specific. This ability closely resembles Gardner's spatial intelligence domain.

Bodily-Kinesthetic Intelligence

Bodily kinesthetic Intelligence refers to the ability to use all or part of one's body to perform a task or design a product. It manifests itself in the gifted dancer, swimmer, the mime and the surgeon (Gardner, 1983). Critics of MI theory suggest that bodily kinesthetic intelligence does not strictly belong, because society does not view it as an intelligence (Matthews, 1988).

Musical Intelligence

Gardner (1983) includes musical talent as one of the seven separate domains considered in the identification of intelligence. He describes it as the ability to discriminate pitch, the ability to hear themes in music; sensitivity to rhythm, texture and timbre; and in its most advanced forms, the production of music through performance or composition (Gardner, 1983). Gardner (1983), discovered that music develops first of all the intelligence. Bamberger (1982)

researching cognitive issues in the development of musically gifted young children, found evidence that musical thinking has its own rules and constraints. These rules cannot simply be assimilated to the other domains or intelligence. Furthermore, Bamberger found two distinct modes of processing music; first a figural approach, in which the child attends to the global aspect of a melodic fragment. This approach is intuitive in nature. The second approach is a formal one. The child can conceptualize his music through the knowledge of a system. Gifted children according to Bamberger demonstrate the figural approach. In summary this research indicates that there is sufficient evidence to demonstrate that musical intelligence is a separate and individual ability.

Like bodily kinesthetics, however musical intelligence remains openly debated as to its status as an intelligence. Furthermore, history is fraught with biographies of musically gifted or talented individuals who led tortured and an unhappy existence. From the literature and biographies of many of these famous prodigies they clearly had little life satisfaction.

Interpersonal Intelligence

Gardner describes interpersonal intelligence as the ability to understand other individuals, their actions and their motivations. It entails the ability to

look outward, to notice the world and make distinctions (Gardner, 1983, p. 239). Additionally, interpersonal skill would involve the ability to act productively based on the knowledge of those actions and motivations. As mentioned earlier, this domain resembles Sternberg's information processing model of practical intelligence (Sternberg, 1991).

This domain of intelligence is one of the first that considers the self in relationship to the external world. According to Gardner this notion of the self is evident in normal children. However, gifted children would be more aware of their environment than non-gifted children and have superior social interactive skills.

Intrapersonal Intelligence

Intrapersonal intelligence, the companion of interpersonal intelligence, refers to an individual's ability to understand himself. This ability requires an understanding of one's own cognitive strengths, styles and intelligence. The core capacity here is to access one's own feelings (Gardner, 1983, p: 241) In this domain a gifted person would be able to put that knowledge to use in planning and carrying out successful activities. A gifted child might demonstrate intrapersonal giftedness by participating in an activity such as making pottery

because they enjoy it, however they would acknowledge that they are not very good at producing objects.

This domain is responsible for a gifted individual accurately identifying their own strengths and weaknesses. Furthermore, intrapersonal intelligence might account for differing levels of self concept and life satisfaction. Furthermore, with more research, intrapersonal intelligence may apply to individuals who may not succeed at school work but become excellent humanitarians.

Moreover Gardner (1983), is of the opinion that intrapersonal intelligence is one of the most private of the intelligences and hence one of the most difficult to research and identify. Measuring it may be as difficult a task as the researching. There are many self perception questionnaires available today, specifically designed to measure gifted individual's self concept (Feldhusen, 1992).

In summary, many of the studies described above provide evidence of intellectual potential that is able to function independently of the others (Bamberger, 1986; Ford, 1983; Porath, 1988 ; Stanley,1986). However, it should be made clear that Gardner (1983), does not propose that each intelligence

exists independently. Ultimately individuals may be gifted in many areas or domains, or have strengths or weaknesses in more than one domain.

CONCLUSIONS

Two separate views of intelligence have been presented with numerous researchers involved in their genesis. The first was a unitary view that gained much notoriety and criticism (Spearman, 1927; Terman, 1925). This unitary view held for an extended period of time, as a result of any critical analysis by the research community and additionally, the ease of which it fit into society's definition of intelligence. Criticism finally came in the 1970s and intelligence theory changed accordingly. Subsequently Sternberg (1985) provided an information processing model that attempted to integrate the cognitive and environmental traditions but still maintained the unitary view of intelligence.

Gardner's theory of intelligence, on the other hand, has generated significant popular appeal with the lay public but has had minimal scholarly scrutiny. Gardner has enjoyed much publicity on talk shows and in the local newspapers. Many researchers cite Gardner's **'Frames of Mind'** (1983)

without having conducted any research or providing evidence of its validity (Gagne, 1991; Sternberg, 1985).

Identification of intelligence and specifically the gifted is not as simple as previously thought. In the past, studies of the gifted have utilized the Stanford-Binet IQ, WISC or WAIS test as the primary identification method (Powell, 1983; Sattler, 1992; Subotnik, 1987; Terman, 1925). Although the Stanford Binet remains the IQ measure of choice, there are a multitude of other methods now available to psychologists; these include **Project Spectrum** (Gardner, 1990) and the **Wolfson Program** (Swaitek, 1991). These different strategies of identification, although recent, involve a much more in-depth analysis of the individual both academically and personally.

Thus, integrating the findings of the various studies with intelligence measures into a coherent and readable fashion would require formulas that would deal with both the unreliability within the measure and the variation across the measures. Additionally, because the construct of intelligence has different definitions for different people, it has created a unique type of problem in meta-analytic procedures and formulas (Hunter & Schmidt, 1982).

SUMMARY

To summarize, in the past an individual's IQ was determined solely by a score on an Aptitude test and these results were predominately shaped by linguistic and mathematical ability. In recent years there has been a subtle shift in focus to achievement in school subjects and in social coping skills. This new perspective may reduce the heavy weighting intelligence tests have in the definition of a gifted individual and lead us to investigate other avenues of intelligence that consider all aspects of the individual.

LIFE SATISFACTION

Along with intelligence, self worth and how one feels about life are key areas of interest to investigators of the gifted. However, clearly defining life satisfaction and then achieving consenus amongst the research community is another matter. Furthermore, the usefulness and costs to society of the many specialty schools and programs fail miserably if the programs do not provide the gifted with a positive self image and some success in later life.

Defining Life Satisfaction

In an attempt to clarify and define life satisfaction, it is important to understand it both intrinsically and extrinsically. For the purposes of this paper intrinsic life satisfaction refers to how one feels about themselves and the happiness they perceive in their life time. Extrinsic satisfaction is how a gifted individual judges or evaluates themselves in relationship to the norms of the society. Society judges sucess via monetary means and status. Thus an individual learns what success is considered to be through the environment and experiences in the society he belongs too.

Life Satisfaction in the General Population

Psychological research indicates that a feeling of well being among the general population is paramount to life satisfaction. However the research community continues to be divided on the specific variables that create a sense of life satisfaction (Mookerjee,1990). Gurin, Veroff and Feld (1960) studied the life satisfaction and well being of the American population and revealed that the population's perceptions of what provided life satisfaction varied considerably. According to their research the largest net effect on life satisfaction was financial

status, followed by marital status and higher education (post secondary). Other researchers however, discovered a positive relationship between life satisfaction and life span patterns, age, race, socioeconomic status, education, and personality traits (Haring, Stock, Okun, 1984). Furthermore, although indications are that American's have an overall positive perception of life satisfaction there is little comparative research from outside of the USA or on any specialty populations within the country.

Little or no research exists comparing the gifted and non-gifted population's life satisfaction. However, research into gifted individual's life satisfaction and the variables that affect it was done by Holahan (1984) with females and Sears (1977), with men. Hollinger and Fleming (1988) identified numerous variables related to gifted individual's feeling of life satisfaction. These variables include marital status, socioeconomic level and personality traits, such as possessing a high level of decisiveness and independence especially among women. Interestingly the variables considered in gifted research to be key factors in life satisfaction appear to be as diverse as those found in the general population.

THE HISTORY OF SELF CONCEPT

The term self concept has its origins in the twentieth century (Burns, 1979). Prior to this most textbooks refer to the soul or the will of an individual. However,

today most theorists would at least partially agree that the self concept of an individual includes a knowledge of themselves (self image) and an evaluation of themselves (self-esteem) (Burns, 1979). Although researchers continue to utilize such terms as self-confidence, self appraisal, self worth, ego and self esteem, these terms refer to some form of self-evaluation. Furthermore self evaluation includes the manner in which that appraisal motivates and directs an individuals' behaviour (Burns, 1979). The past 30 years has seen numerous theories of self concept rise and fall in popularity. These theories span a total range of styles and philosophies and are beyond the scope of this paper. For a better perspective on the numerous theories of the self the book 'Self Concept' by R.B. Burns is available (1979).

Measuring the Self Concept of the gifted

Attempts at measuring the self-concept have led to a plethora of scales and techniques. The early methods of measuring self concept used by Terman and cohorts were generally untested likert scales and personal interviews. Terman personally designed the likert measures and interviewed each one of the gifted participants, many of which he remained in contact with throughout their lives. As such his impartiality and consequent statements of a higher feeling of self worth and success for the gifted may be suspect.

According to Wells (1979) problems arise with likert measures as they focus on specific groups of individuals and often measure different aspects of the self concept depending on the theories they espouse. Many of the scientifically tested measures identify different domains of self concept. As an example, the Shavelson theory (1976), emphasizes a non-academic, an academic and an emotional self-concept. This theory has achieved substantial acceptance in the research community and based on this theory Marsh (1988), designed a likert scale called the **Self Description Questionnaire (SDQ)** (Byrne,1988; Watkins, 1992).The scale changes depending on the age of the individual. Unfortunately, the idea of a fluid self concept although it is a major belief in the research establishment it continues to be hotly debated by others (Piers, 1964).

Other measures of self concept/ self esteem focus on a specific population. Feldhusen (1992) recently designed a measure of self concept specifically focusing on the gifted. **The ME: A Self Concept scale** designed for 3rd to 10th graders. This measure demonstrates good internal consistency and validity. Still other measures concentrate on the elderly population. There are innumerable other scales suitable to measure the self-concept, such as, the Piers-Harris Self Concept scale (Piers, 1969, 1984) Self-Description Questionaire, (Marsh, 1990) and the Adjective Checklist (Gough, 1980)all demonstrate good reliability and validity.

External Influences on the Self Concept

The school system usually identifies the gifted individuals as having a superior intellect. Life exposes these students to a myriad of physical, social and psychological experiences and changes. Woodlands and Wong (1978) state that there is an implicit and an explicit cirriculum in school. Explicit means the subjects gifted students study and implicit is the way in which a student learns about their position in the academic and social setting in relation to his/her peers. It is this implicit curriculum that defines a student's self-concept and dictates his/her performance in school. Bourisseau (1972) postulates that motivation is a more significant factor than intelligence in determining success levels in individuals and an individual's self-concept is the key factor involved in that motivation. Furthermore, according to Bloom (1974) the early environment molds and forms the basis of how these students perceive themselves in later life. Contrarily Burns (1979) postulates a learned self concept that is not static. Thus although school may play an important part in the development of the gifted's self worth it is not the only factor affecting the individuals' feelings about themselves.

Meta-Analysis on the gifted Self Concept

Hoge and Renzulli (1993) reviewed two types of short term studies on the self concept using meta-analytic procedures. The first group concentrated on the differences between gifted and non-gifted individuals' self concept and the second

focused on the effects on the gifted's self concept in different school programs. Their findings suggest higher academic self-concepts for gifted individuals but otherwise the results were too variable to be conclusive. Additionally Vaughn (1991) employing a meta-analytic methodology found that special pull out programming appeared to have a small but positive effect on achievement over a short period of time. However, Vaughn's results on the gifted individuals' self concept were inconclusive.

SPECIALTY PROGRAMS

Studies of Gifted Programs

This section presents a synopsis of the studies on specialty programs for gifted individuals. Research denotes little consensus on the best method of teaching or whether there are long term program benefits to gifted individuals. Included is a discussion of three different types of programming available to the gifted. Interestingly, the first approach discussed here on ability grouping includes a meta-analysis. The second specialty type program reviews findings related to acceleration programs within the regular school system. The final discussion relates to the different types of special schools, such as the private institutions and special pull out programs for gifted children.

ABILITY GROUPING

Kulik and Kulik (1982; 1984) using a meta-analytic methodology examined 78 studies, 52 on the topic of ability grouping and 26 on the effects of accelerated instruction on students. Their findings were small but significant in ability grouping. However, when high ability students received enriched instruction in honours' classes, there was a strong effect size, thus, providing good evidence for gifted programs. Unfortunately, many of the programs were short lived and their long term efficacy remains in question. Furthermore, many authors failed to include data on the actual definition of high ability in their meta-analysis.

ACCELERATION PROGRAMS

Kulik's (1984) meta-analytic work on acceleration found evidence that gifted individuals surpassed non-accelerated gifted individuals of the same age, by more than one grade level on examination performance. Additionally, students said they found the accelerated programs beneficial. Notwithstanding, the majority of the

acceleration studies, used in this meta-analysis were fewer than three years in follow-up. Thus, their long term (5, 10 to 20 year) efficacy is in question. Additionally, Janos (1987) investigating the long term significance of acceleration in school for the gifted, found that special programs did not have long lasting beneficial effects. By middle age, according to Janos the beneficial effects had entirely disappeared.

Assessing School Programs for the Gifted

Schools and special programs for the gifted have been in existence since the Roman times. Investigations into their usefulness and benefits have led to confusion and indecision among educators. Over the past 75 years researchers have investigated schools and specialty programs prior to or during a schools' existence (Kulik & Kulik, 1982; White, 1987). Each of these programs promises the most effective method of learning for the gifted individual. Supporters of special school programming argue that there is a need for special programs to stimulate the gifted child in ways the public schools never could (White, 1987; Swaitek, 1990). Opponents say that a child's social behaviour changes in special schools, and that these children are **"difficult"** when faced with the knowledge of their giftedness (Freeman, 1991). Few researchers have quantitatively examined the long term

effects of specialized programs. Upon investigation this lack of follow-up is mostly due to the death of the program originator or the lack of long term commitment by educators and politicians. Few have questioned the gifted that have attended special schools in later life, as to the benefits or liabilities of these special programs. Fortunately, for the purposes of this meta-analysis, researchers have examined some of the special schools but usually in conjunction with other issues. (Janos, 1987; Subotnik,1988; White,1987).

In summary, by first quantifying the findings, then categorizing the moderating variables by the type of specialty programs, it may be possible to attain an indication of the relationship between life satisfaction and special schooling in gifted individuals.

LIMITATIONS IN THE LITERATURE

The studies reviewed in the background literature on intelligence and life satisfaction was predominately from the original theorists. This is due in part to their newness and complex nature. Utilizing these theories in the identification of the gifted creates many enigmas and inconsistencies in the literature. Determining

how the theories are practically put into operation to identify the gifted remains unclear.

Only Gardner considers an Intrapersonal intelligence. He encompasses the many aspects of the self and the individuals' perception of their environment into a specific domain of intelligence. Unfortunately there is little research on the validity and reliability of either methods used in the of identification of the gifted. Furthermore, the intricate nature of the theories, especially Sternberg's, makes the literature difficult to decipher and to verify.

The methodological approaches used in the literature on schools and their programs contain flaws. As suggested previously, many of the studies included in the literature review, investigate specialty programs as a lateral issue and the information provided in the studies is sparse at best.

SUMMARY

Two separate views of intelligence were discussed. First a unitary view, postulated by Spearman early on in this century, revised numerous times with the most in-depth and recent proposed by Sternberg. The second, proposed by Gardner

of a multiple intelligence that can work both independently and interdependently. As observed there is little consensus among the research community on either of these views. Unfortunately, both the Sternberg and Gardner proposals are fairly recent and as such there has been very little research on them.

In conclusion, the literature reveals that many changes occurred during the past ten years in the area of intelligence. Unfortunately the question of its multiplicity or singularity is far from finished and the available procedures used to measure giftedness are far from uniform. However, what is of note with these new theories is that the flexibility within both views permits a broader and more practical vision of intelligence.

Additionally, this chapter examined the life satisfaction of gifted individuals who have attended special programs in school. It is important to note that the variables are quite numerous and the types of programs are plentiful. Interestingly, to date this area has achieved a great deal of investigation under meta-analysis. The results demonstrated two things. One, that meta-analysis simplified the multitude of conflicting findings into a coherent summary. Two, it identified the limitations in the existing research such as the long term efficacy of the programs and demonstrated that further research was needed in specific areas.

The next chapter outlines the methodology or processes used in this meta-analysis of the gifteds' life satisfaction.

CHAPTER 3

METHODOLOGY

This chapter outlines the methods used in conducting a meta-analysis. It begins with a description of how studies are located and the methods used to cross reference them to access more research papers. The next stage entails specifying the criterion used for inclusion or exclusion in this study. Subsequently, a description is given listing the particular features salient to the study. Finally details of the meta-analytic statistical procedures are delimited.

Location Procedures

There were numerous methods used to locate longitudinal studies relating to research on the gifted. The easiest and fastest method was retrieval through the computerized data banks of the library.

This was done via a search, **CIJE** (Current Index of Journals in Education), **RIE** (Research in Education, mostly microfiche), **Psychological Abstracts** and **Dissertation Abstracts** through UBCLIB.

Other computerized sources include **ERIC** (Educational Resources
Information Center), **CD-Rom** and **Gateway** (a procedure of searching through
the libraries of other Universities via the UBC modem).

Descriptors

Included is a sample list of some of the key words used to begin the search
through the data banks.

TABLE OF KEY WORDS

Source for Articles	Descriptors	Descriptors	Descriptors
UBC LIB	Psy Lit Longitudinal studies, Gifted, life satisfaction, superior intellect, special programs, achievement, acceleration, Adulthood	CIJE Longitudinal Studies, Gifted, life satisfaction, superior intellect, special programs, achievement, acceleration, Adulthood	ERIC (microfiche) Longitudinal Studies, Gifted, life Satisfaction, superior, intellect, special programs, achievement, acceleration, Adulthood
CD-ROM	same words plus; self Actualization, self worth, happiness, self concept, success	same words plus; self actualization.happiness,self worth, self concept.feelings of well being, success	same words plus; self actualization, self concept, happiness, self worth, self esteem,

OTHER SOURCES

Professor Marion Porath, UBC, specializes in the area of gifted	Longitudinal studies of gifted and conference papers
Professor Nand Kishor, UBC, specializes in the area of Meta-analysis	Provided 2 meta-analytic papers on specialty programs
Social Science Citation Indexes (SSCI)	Terman articles, Oden, Sears 1925-1960, 1985 through 1993.

Lastly, a search conducted through the bibliographies of the original Terman articles. Then cross-referencing these through the **Social Science Citation Indexes**, provided a valuable source of studies for this meta-analysis.

Study Criteria

In all, the search generated about 150 articles. A number of these are eliminated as they did not meet the defined criteria. The criteria for inclusion in the meta-analysis were: statistical data, sample size, means, standard deviations, proportions', t- tests, f- tests or correlation coefficients. Quantitative data had to be in sufficient detail for calculation of an effect size estimate. Other criteria included the use of a Likert type scale or questionnaire on satisfaction in the follow up study. Some studies measured life satisfaction globally, others measured the various components of satisfaction. Still others measured general feelings and feelings of success. Additionally, all participants were questioned a minimum of four years following their initial identification as gifted. Furthermore, studies had to be free of individuals with any known emotional, physical or psychological infirmities. This was in part due to the criteria set by Terman in his early work with the gifted.

Definition

The definition of gifted children required a score above 115 IQ on a standardized aptitude test. A specific IQ test could identify giftedness. In some cases the measure, such as the Stanford-Binet was used in combination with other procedures (as an example those used in "**Project Choice**"). Only standardized IQ tests with record of good reliability and validity studies were reported in this meta-analysis. This somewhat limited the choice of studies.

For inclusion in the meta-analysis, studies must have investigated an individual's life satisfaction using the following criteria. First, the study needed to include either an interview conducted by a qualified researcher in the area of gifted individuals, or the administration of a self concept measure. Second, the measures or interviews had to be comparable in their style of questioning. This, however, was not always possible as information given by the author was some times scant. Consequently, the variables listed in the results' section of a particular study were often inadequate to ascertain the type of questioning used. When there were sufficient data in the results' section of a study then the findings could be included in the meta-analysis.

Clearly outlined methodologies were required in longitudinal studies detailing their start up time, test time, retest time, if any, and the follow-up period. Gifted participants were greater than twenty years of age at the final stage of questioning and the studies would have taken place over a minimum of four years. This however, was not always possible particularly due to the limited number of longitudinal studies available on specialty schools. As a result the follow-up period in this area was reduced to three years.

STUDY SOURCES

Studies that were identified as pertinent differed in many ways. Coding of the individual study features required that they be first categorized. The three principal categories included, source characteristics, participant characteristics, and methodologies employed.

Source Characteristics

Coding for this section of the meta-analysis included (1) author(s), (2) date of publication, (3) source of publication (journal or conference), (4) length of study and,(5) sample source. These characteristics are important because of changes that

have occurred over time in research methodology. Identifying these features allows classification of the possible variables in a study's history that may cause the erratic results.

Methodologies employed

Those studies selected had methodologies that provided for quantifiable results. Anecdotal evidence and author's impressions were not considered. Coding in this area included (1) how follow-up was carried out (mail out or personal contact), (2) IQ measure used (Stanford Binet, WISC or other), (3) length of special school program if one, (4) study sample size (1-100= S, 101- 499 = M and 500+ = Large); (5) pre or post 1960 * data (6) location of study population; (7) sex specific, male or female, gender differences were considered separately, however numerous studies deal specifically with one gender or the other,. (8) statistics used; correlations denoted by **r**, means, **t-tests, f-tests, p**= proportions).

---

* 1960 was chosen as a cut off date as many historical changes occurred in the US and IQ tests came under scrutiny and was no longer considered the only method of intellectual measurement.

Participant Characteristics

The final study variables describe the characteristics of the participants. Coding included (1) age, (2) sample size denoted by 'N', (3) Sex (if information is not provided it is assumed that both sexes are included in the study) (4) population size of males; (5) population size of females; (6) IQ; (7) age at time of second interview. (8) Terman group or other.

Thus by coding the studies and their particular features, it may be possible to understand how and why there is so much variation across study results. Additionally it may be possible to specifically identify these features so that we may better understand the gifted.

Meta-Analytic Procedures

The statistical procedures employed in this study are based on the works of Hunter and Schmidt (1977). This procedure uses adjustments which work with mostly predictive variables, Validity Generalizations, named by Schmidt

and Hunter. This method acknowledges the imperfection of the construct itself. Prior to Hunter and Schmidt's work it was believed that validity had to be measured separately for each situation by a study conducted in that setting. In other words, validity findings could not be generalized across settings. These adjustments are designed to deal with problems such as restriction of range, sampling error, and, of course, unreliability in both the dependent and independent variables. However, unlike Glass (1976) who emphasizes **p-values** as effect sizes, the Hunter and Schmidt procedures place a strong emphasis on **r** effect sizes. **P** values attempt to cumulate significance levels across studies to produce an overall **p- value** for the set of studies as a whole. Unfortunately, significance levels tell us nothing about the magnitude of the effect.

Furthermore, the traditional narrative method or qualitative review will not be included in this meta analytic process mostly due to the variability in inter-rater conclusions (Rosenthal, 1980). Additionally, these results are limited in their scope and usefulness.

Hunter and Schmidt (1982; pg:274) strongly recommend correcting for unequal sample sizes, using a special formula (**Rc**). After numerous corrections for sample size differences on substantial population inequalities I observed that this process changed the corresponding results so minimally that after four

or five such corrections it was dropped from the procedure. According to Hunter and Schmidt the predominate use of the **"Rc"** formula, for unequal populations is that it doesn't change the results but changes the confidence interval.

$$r_c = ar / \sqrt{[(a^2 - 1)r^2 + 1]}$$

where

$$a = \sqrt{[.25/pq]}$$

Hunter-Schmidt Validity Generalizations procedures convert the effect sizes to a common **r.** This procedure entails converting the desired descriptive statistic into a common effect size, averaging the effect sizes across studies, then calculating the variance. Thereupon correcting or adjusting the results dependent upon the issues relevant to the studies.

File Drawer Problem

Rosenthal (1979) coined the phrase **'File Drawer Problem'** as a result of concern for the number of unreported and unpublished studies. According to

Rosenthal these papers are usually unpublished, as a result of their nonsignificant findings. Rosenthal went on to develop a method to estimate how many unreported results would be necessary to reduce a meta-analytic procedure to statistical non-significance using p values. Schmidt and Hunter (1979) stated that it would be more informative to provide information on effect sizes. In essence it would be better to know how many missing studies averaging null findings would have to exist to bring r down to a specific level. Thus they developed the formula:

$$\overline{r_k} = \Sigma \frac{r_k}{k}$$

Where r_c represents the critical value or specific level.

$$x = k(\overline{r_k} / \overline{r_c} - 1)$$

Where k is the number of studies, r is the mean effect size and x is the number of lost studies.

<u>Summary</u>

This chapter summarized the procedures involved in carrying out a meta-analysis on the life-satisfaction of gifted individuals. This included an outline detailing the breakdown of the study features, then the reasons for the categories and dates. Finally, a discussion of some of the issues related to unfound studies referred to as the **'File Drawer Problem.'**

The following chapter describes the findings in the present study.

CHAPTER 4

ANALYSIS OF RESULTS

This chapter begins with a synopsis of the results and an overview of the findings from the studies that fulfilled the criteria set out in the methodology. These results serve a number of purposes. The first is to determine if the characteristics of the sample source, the methodologies, or the participants sampled, demonstrate any systematic pattern or influence on the study outcomes. The second is to ascertain the overall direction, either positive or negative, and magnitude of the relationship between life satisfaction and giftedness. The third is to establish how far the overall results differ, from the individual study findings and finally, to delineate potential variables responsible for the variation.

The subsequent sections detail the specific moderating variables to determine how any or all would affect the study results.

SOURCE CHARACTERISTICS

Characteristics of the Sample

The meta-analysis consisted of 60 journal articles, 15% unpublished papers found on microfiche, 15% monographs from the original Terman research, and 10 % published or unpublished conference presentations as shown in Figure 1.
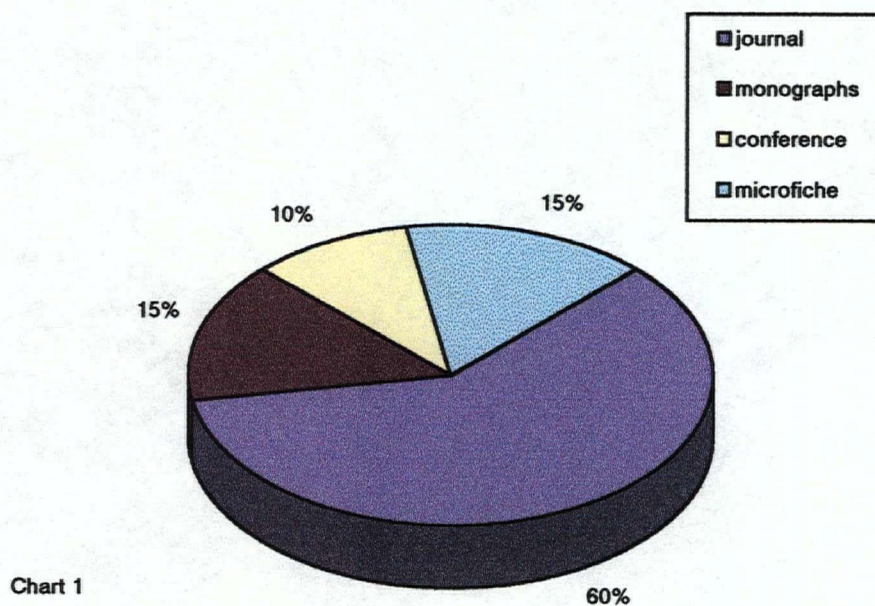
Figure 1: Source of Publication

The characteristics of the sample were interesting, 47% of the studies came from the same population, the Terman group. Additionally, 63% of the studies utilized data that were over 20 years old. Moreover, 11% of the data came from research that was less than 5 years from the initial testing to the completion of the study.

All of the studies used in this meta-analysis originated in the US, with over 69% of the research population coming from California. Not included in the findings were two papers, one from China (Zha, 1986), and the other from Russia (Heller, 1991), these are still pending translation.

Of the original 19 studies deemed to meet the requirements of this meta-analysis, 5 had questionable results, due to a lack of translatable statistics. This left 14 studies, 9 of which employed data from studies conducted earlier in this century by Terman and associates. More specifically only 2 of the 9 studies utilized first hand contact with the originally identified gifted group (Oden, 1960; Sears, 1977).

Methodologies Employed

Percentage use of IQ measures are shown in Figure 2. Of the original

19 studies, 11 used Stanford Binet IQ tests as the solitary method in the

identification of giftedness. The WISC was not used in any IQ testing for

giftedness. A further 5 studies used other methods to identify giftedness.

These methods included Gardner's multifaceted method and various other

combination of IQ tests. Finally, 3 of the studies included in the meta-

analysis did not identify the procedure used to classify the gifted population.
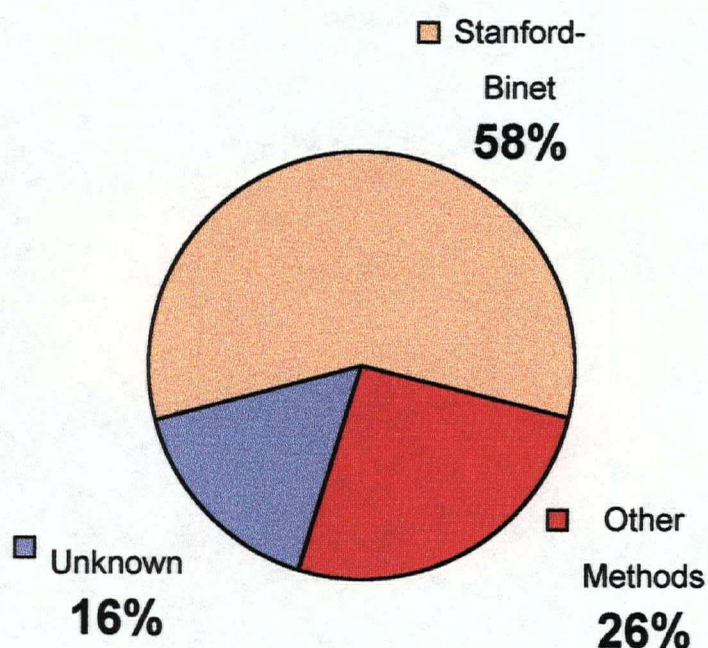
Fig 2: Gifted Identifcation Method

chart 2

The procedure used in the follow-up of the gifted individuals' life satisfaction was inconsistent across studies. As a result of the dissimilarity in methodologies, observing any patterns or categorizing was impractical. Thus no consistent method emerged as having an influence on the gifted.

Length of School Programs

Of the seven separate studies investigating specialty schools, three of the programs were long term academic programs, two others were career planning. The remainder of the programs were academic courses lasting less than one year.

Sample Size

The sample size of the study was determined by the number of participants. Study samples are classified as small, medium, or large. This was defined in the methodology section. Only 3 studies met the criteria of a large sample, 8 are classified as medium size studies, and 7 classified as

small sample studies. One study did not give specific details on sample size as it was part of an existing meta-analysis.

A list of other variables taken from the existing studies and identified as relevant to this meta-analysis are located in appendices A,B, and C under Source Characteristics, Methodologies Employed and Participant Characteristics.

OVERVIEW OF THE RESULTS

In this research, 14 separate studies yielded 39 effect sizes on the relationship between giftedness and life satisfaction. These effect sizes are shown in Appendix D. A stem-and-leaf plot is useful for the initial visual observation of the overall results. (These results are presented in Figure 3). The dot or decimal point divides the plot into two parts: the stem is on the left side and represents the first digit in the effect size. The leaf is on the right side and represents the digit after the decimal point. The plot reveals a slight positively distributed effect size.

STEM.XLS

```
-0.8  .
-0.7  .
-0.6  .
-0.5  .
-0.4  .
-0.3  .
-.2   .  6
-0.1  .  0  9
 0    .  1  3  12  5  7  7  8  8  9
 1    .  1  1  2   2  4  4  6  9
 2    .  0  0  0   1  1  5  5  5  8
 3    .  0  1  2   3  5  9  9  8
 4    .  6
 5    .  8
 6    .  5
 7    .
 8    .
```

Figure#1 **Stem-and leafPlot**
Satisfaction effect sizes

The next step in the meta-analysis is to group the individual effect sizes into specific moderating variables to determine their effect, if any.

SPECIAL SCHOOLS AND PROGRAMS FOR THE GIFTED

In this section, a description of the responses of gifted individuals who attended special programs is compared to gifted who did not attend special schooling or programs. As previously discussed, many of the studies used in the meta-analysis do not specifically relate to the issue of life or career satisfaction. All of the results extracted from the study are longitudinal and retrospective. As adults, all participants answered a questionnaire inquiring how they felt about their life successes. Some of these results are correlational. These studies questioned the individual on competence and self efficacy. These correlations were direct measures of effect sizes. Other studies provided mean differences between groups such as an F-test or T-test. These test statistics convert to common statistics using the Hunter and Schmidt adjustments. Either directly in the case of 't', or where the differences between two means are all that is provided, these were divided by their pooled variance to give a 'd' value. Pooling was necessary due to the unequal sample sizes.

Computational formulas are taken from Rosenthal's effect size indicators that use formulas developed by Hedges, Rosenthal, and Cohen (Rosenthal, 1984). Effect size 'd' is then converted to the correlation co-efficient 'r' as recommended by Hunter and Schmidt (1982). Finally, these were corrected to eliminate sampling error and any error in measurement. This process was repeated for life and occupational satisfaction when necessary.

The principal difference between this meta-analytic procedure and other methods lies in the Hunter and Schmidt technique of correcting or eliminating error in both the independent and dependent variable. This procedure was necessary due to the dissimilar IQ tests and the different methods of attaining Life Satisfaction results. Many of these studies used self-report measures that were either not identified by name, or developed specifically for the study by the author (e.g. Oden, 1960; Sears, 1977). Over 80 percent of the self created life satisfaction or self efficacy measures were not tested prior to their use, for their reliability or validity, on the general population or with gifted individuals.

THE RELATIONSHIP BETWEEN GIFTEDNESS AND SPECIAL SCHOOL PROGRAMS

The search yielded eight studies that initially met the criteria established for this meta-analysis. Results from eight papers yielded six effect size estimates. Findings of three of the eight were discarded as conversion to a common effect size was unworkable. Janos (1987) provided a result called **"McNemars Q,"** and no effect size estimate could be found for this statistic. Finally a third meta-analytic study done by Kulik and Kulik's (1991) was removed as a result of the exceedingly short follow-up period. The participants in this study were followed for less than three years and this created problems of interpretation of long term life satisfaction. Kulik 's study investigated the effects of acceleration on gifted students using meta-analytic methodology. His findings related more to the participants' early years and did not provide any long term (greater than four year follow up) effects of specialty programming. The third paper to be removed did not provide enough statistical data to convert the results to an ES. Thus of the eight studies, five effect sizes were calculable, and this included 1111 participant responses.

The weighted mean effect size for special schools was .10 with the corresponding variance of .03. Sampling error accounts for 0 percent of

the observed variance in the correlation's. Of the seven original studies, four reported significant findings. As previously mentioned two of the results were discarded, one because of lack of available statistical conversion to the common effect size estimate, the second due to its status as an outlier. In perusing the original effect size estimates, only Swiatek's (1991) study demonstrated a negative effect size of -.26. Interestingly, this study did not use a standardized IQ test procedure and subjects participated in a specialized math program only. Thus, by removing this outlier, the common effect size increased to .22 with a variance of .01 and an error variance of .004. Caution as to any interpretation of this effect size is important, and although this effect size is positive and statistically significant, it is rather weak.

Unfortunately this area of research did not reveal a large number of studies. In comparing the results on special school versus special types of programs within a school, the difference was more dramatic. Schooling had a corrected mean effect size of .25, and programs had a mean effect size of .11. Although many papers exist on the efficacy of particular programs and their initial implementation, they were often qualitative in nature and sample sizes were too small to include in this meta-analysis. Other studies report significant differences in psycho-social measures, but give little in the way of descriptive statistics as back up. There did not

appear to be enough available studies to determine any moderating variables. Furthermore, although the results are positive, due to the limited number of studies any substantive interpretation of the results should be cautious. Table 1 categorizes many of the variables in the studies investigating gifted schools.

Table 1: **The relationship between giftedness and special school programs**

Author	Year	N#	Male	Female	Research pre /post 1960	length/S= C= or F *	School or Prog.	ES
Subotnik	1988	386		386	pre	F	school	.19
Subotnik	1988	358	358		pre	F	school	.32
Hollinger	1988	108		108	post	C	program	.21
Hollinger	1992	126		126	post	C	program	.02
Janos	1987	38	26	12	pre	S	program	unk
Rusch	1963	unk			post	S	program	.80
Swaitek	1991	95	61	34	post	S	program	-.26
White	1987	unk			pre	F	school	unk

Note S= summer or short term project 1 yr.

C= career development only F= full term schooling more than 3 yrs.

THE RELATIONSHIP BETWEEN GIFTEDNESS AND LIFE SATISFACTION

The research into gifted individual's life satisfaction is much more prolific than that of specialty programs, and an investigation into this relationship provided more substantive findings. The results presented are first from an overall perspective, followed by a look at numerous possible moderating variables.

The results taken from the findings on life satisfaction were ascertained by Likert style self-report questionnaires and interviews. Unfortunately, only a few of the authors provided reliability indices for their self report measures. Consequently, it was difficult to correct for error in measurement as recommended by Hunter and Schmidt (1990).

Overall Effect size

There were 41 possible effect size results taken from the literature. These were then reduced to 35 effect sizes. This represented the data from 11,384 questionnaires on satisfaction. After the removal of the outliers, using procedures recommended by Hunter and Schmidt (1982) the mean effect size was .12. Approximately 81% of the effect sizes were positive.

The results of the studies are observed on graph 1 they indicate that the effect size estimates ranged from -.19 to .35 with a standard deviation of .1. This range included 21 of the 33 studies. After correction for sampling error and error of measurement, (Hunter and Schmidt adjustments) the mean effect size was .14, with a standard deviation of .08 and an error variance of .00. Although the overall effect size was statistically significant, confirming a positive trend between satisfaction and giftedness, this relationship was weak, and only 60 % of the studies fell within one standard deviation. As a result of this, it was necessary to investigate the influence of other possible moderating variables.

Satisfaction Effect Sizes

Satisfaction of Gifted Individuals
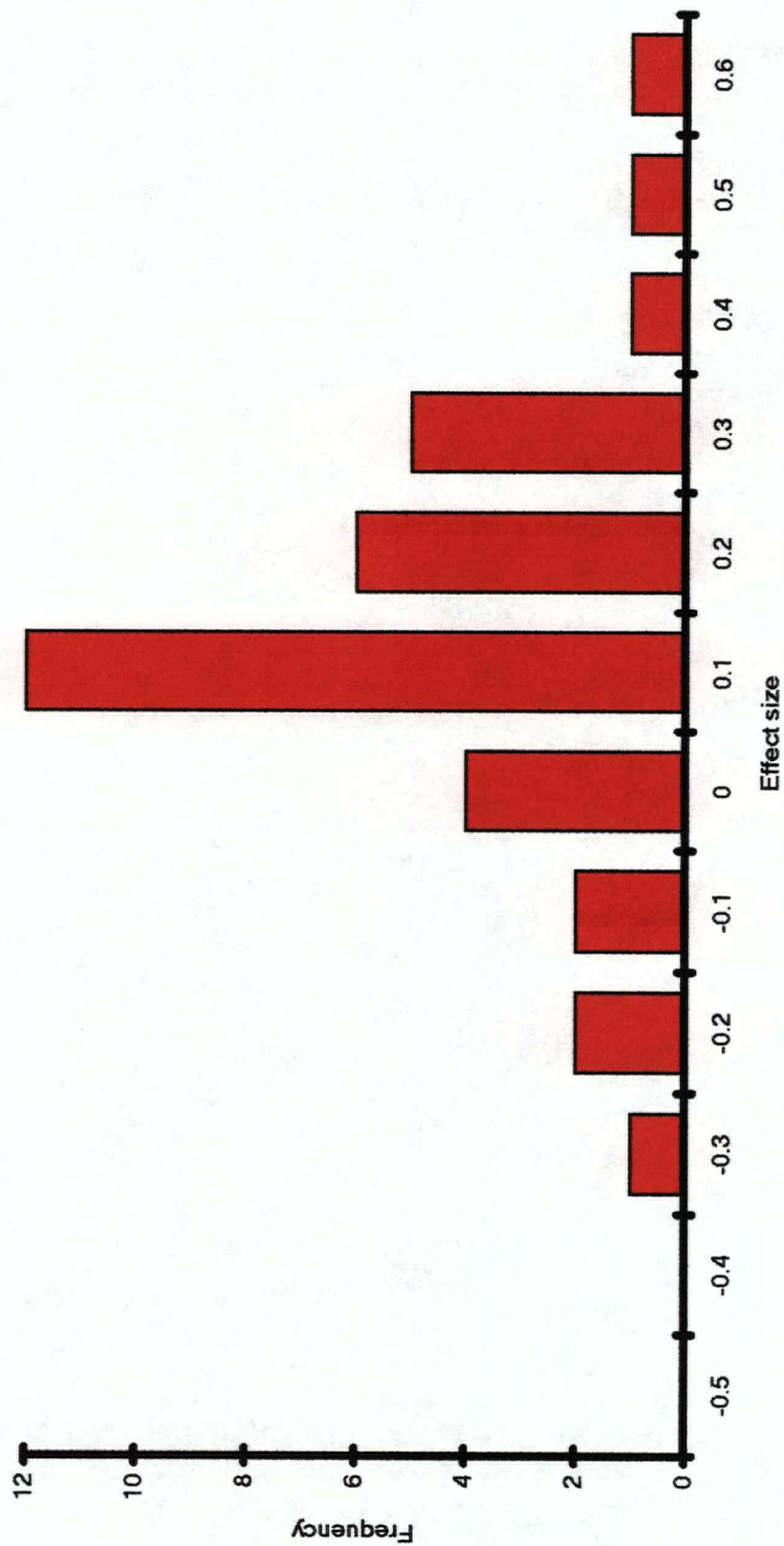
GRAPH 1

The relationship between life Satisfaction and Giftedness

After careful scrutiny of the studies, investigating the relationship between life satisfaction and giftedness, it was decided to divide Life and Occupational Satisfaction into two separate variables. Of the studies investigating life satisfaction, there were 16 ES estimates that fulfilled the criteria set out in the methodology. Outliers were investigated and removed, leaving 14 studies that included 3089 participant responses. Table 2 illustrates the mean effect sizes after correction for attenuation. Consequently 14 studies were combined to produce a mean ES correlation co-efficient for life satisfaction of the gifted.

LIFE SATISFACTION

TABLE 2:

STUDIES	Mean ES	Var. of ES	Stand. dev.	Error Var.	Var. pop correlation
14 (2)	.10	.013	.12	.005	.009

*Outliers written in brackets.

Life Satisfaction Effects

For life satisfaction, the corrected mean effect size was .10, with a variance of .01 and an error variance of .005. Two outliers were detected and deleted and the ESs for the remaining studies ranged from -.10 to .32. Although this corrected mean effect size is significant at the .05 level, an ES of .10 indicates a very weak though positive relationship between giftedness and life satisfaction. Removal of occupational issues from life satisfaction lowered the overall ES, reducing it from .14 to .10. These effect sizes are shown in graph 2.

The following sections separate other moderating variables into characteristics that may have influenced the variation in the results across studies.

Life Satisfaction Effect sizes: Graph 2
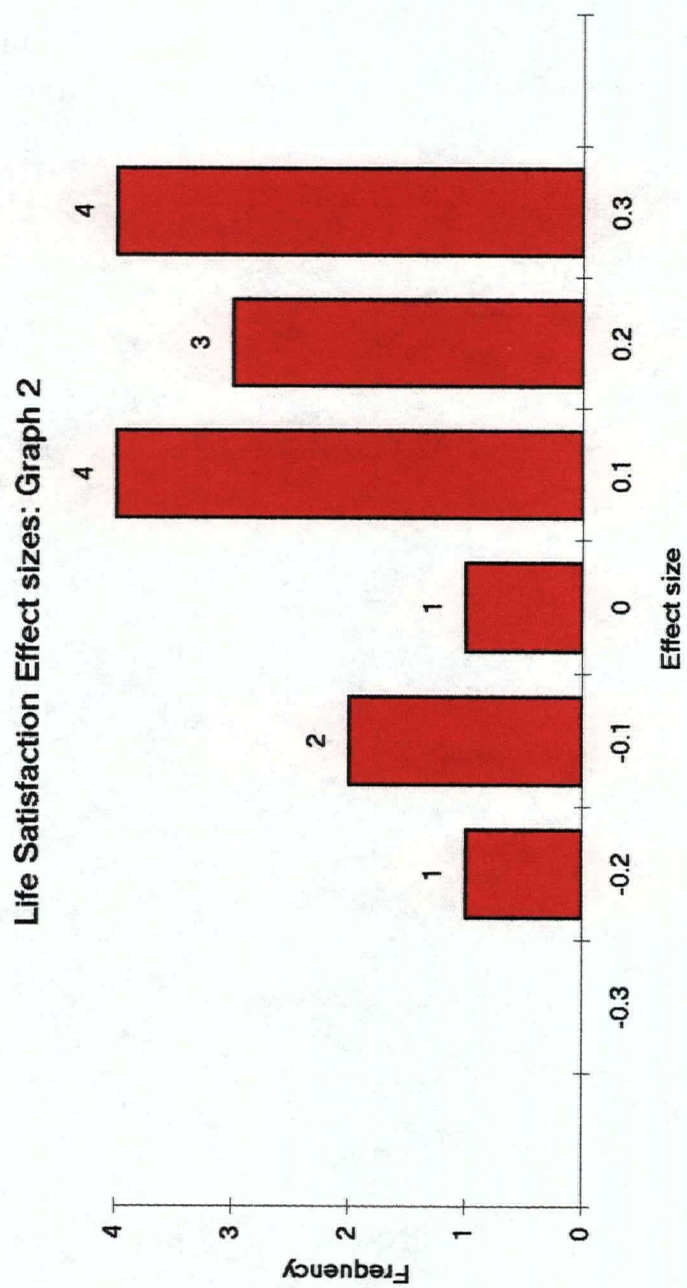
Gender Effects

When men and women are separated according to their life satisfaction, the mean correlational effect size was .3 for men and .13 for women. These results were statistically significant at the .05 level. However, the mean correlations overlapped within their confidence intervals. The error variance for both males and females was 0. In this situation, a correction for restriction in range and error in measurement did not change the mean effect size correlation. When combined, the mean correlation after correction for sampling error was .20 with a variance of .04 and an error variance of .006. These ES results included 83% of the studies. Outliers were detected and deleted prior to the combination of any data.

Study Population Effect

In a further search for possible moderating effects, two distinct experimental groups emerged. The first group included the original Terman sample from California. This group accounts for approximately 47 percent of the existing ES estimates. Additionally, of the original 19 studies only 2 studies, Oden (1960) and Sears (1977), used first hand contact with the

Terman sample. The balance of the studies made use of existing data on the Terman group. These individuals have been studied and restudied.

The second group of gifted was composed of other gifted individuals around the US, that fulfilled the statistical requirements for this meta-analysis. The mean weighted effect size for the Terman group was .16, with a standard deviation of .09;   the non -Terman group had a mean effect size of .11 and a standard deviation of .05. Although each is statistically significant, these mean effect sizes represent a rather weak though positive effect . Additionally, there was little difference observed across studies. Correction due to sampling error changed the overall mean effect size to .18.

Early Terman effect size

Three studies emerge from the early research of Terman. These studies utilized 665 participant responses. The mean effect size for this group was .38 with a variance of .02.

All life satisfaction questionnaires or interviews were done prior to 1977, some as early as 1940. These early ES findings demonstrated a moderate positive relationship between the Terman gifted population and their later life satisfaction.

Age Effect

The examination of age at time of the study and the age at follow up was investigated as a possible moderating variable. The categories delineated were young : 0-23 years, middle age 24-40 years, and 41 years and over. The young group had a mean effect size of .08 and a standard deviation of .14. The middle age group exhibited a relatively larger mean effect size of .21 and a standard deviation of .09. The third group, aged 41 years and older had a mean effect size of -.05. Outliers were located and excluded from the analysis. The qualitative nature of the relationship of age to gifted life satisfaction is unclear due to the large standard deviation. For the older

group aged 41+ , findings were non- significant at the p<.05. In summary, of the three groups, only the middle age group was significant at the .05 level and this result, although positive, was weak. Table 3 outlines the studies that fall into the categories of young, middle age, and old. Each study gives the sample size and the effect size.

AGE EFFECT
TABLE 3:

YOUNG 0-23 years			MIDDLE AGE 24-40YRS			OLD 41years plus		
Study No#	Sample size	Effect size	Study No#	Sample Size	Effect Size	Study No#	Sample Size	Effect Size
16	19	.21	3	386	.19	20	7	-.08
28	95	-.26	4	358	.32	21	19	.25
33	100	.002	14	201	.05	22	15	.08
			27	54	-.28	20	7	5.6
			35	.28	-.01	27	325	.25
			36	47	.25	31	397	-.19
						32	316	-.1
Total =	214	r=.08	Total	1371	r=.21	Total	1178	r= -.05

IQ Grouping

Effect size estimates were also grouped into IQ categories. Many authors had different definitions of giftedness and their corresponding entry IQ level. These differences are graphed in Appendix D-1

VOCATIONAL SATISFACTION

The relationship between occupational satisfaction and giftedness has been widely studied and discussed in the literature. We studied this relationship from various perspectives. To begin with, an overall vocational ES estimate was ascertained. Then, where possible, effect sizes were split and related to various moderating variables, this included gender and the location of the sample drawn.

Overall effect

Although, 11 studies were combined to provide an effect size estimate, that included 2601 participant responses. It is important to note, however that many of the participant responses may be re-calculated results from the original Terman data. The mean ES was .19. One outlier was detected and eliminated prior to these calculations. The study effect sizes ranged from -.01 to .39 The variance of r was .02 with an error variance of .00. The overall effect size of .19 was statistically significant, positive, though weak. Graph 3 shows the effect sizes for vocational satisfaction.

Vocational Satisfaction Graph #3
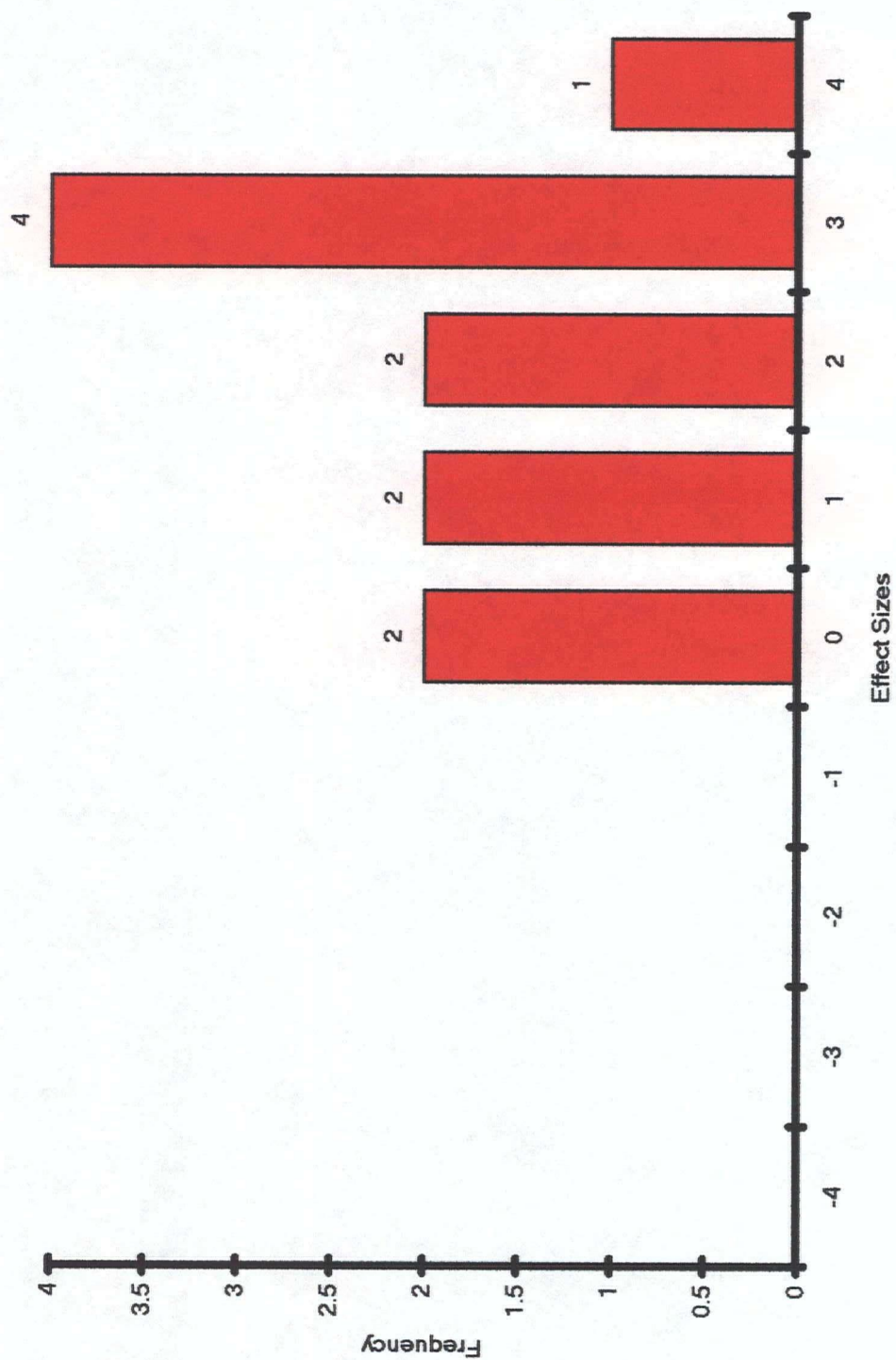
Sex Effects

Table 4 provides a breakdown of the effect sizes for men and women. Outliers were removed prior to combining the effect sizes. The number of outliers are noted in parentheses. Unfortunately, only two studies were obtained on men and both of these employed the Terman sample. The male mean effect size was .34 with a variance of .02 and an error variance of .002. For females, the mean effect size was .16 with a similar variance of .02 and an error variance of .002. The mean effect size for a combination of all studies was .22 all ES estimates were positive. There were three outliers in this analysis. The variance was .01 and the error variance was .003.

SEX EFFECTS

TABLE 4

Sex	men	women	both
Number of studies #	2	9	11
Sample size	548	2111	2063
mean effect size	.34 (1) *	.16 (1)*	.22 (2)*
variance of mean ES	.02	.02	.01
error variance	.003	.004	.003

*The number of outliers is in parentheses.

The Effect of Location

Table 5 provides effect sizes by location of the studies. Over 75% of the results done on a gifted individual's vocational satisfaction came from California. Outliers were removed before analysis. A positive relationship was observed in both the California group and those conducted outside California. The combined results confirmed a mean effect size of .24, the variance across studies was .01 with an error variance of .004. All results were significant at the .05 level.

Location of Studies

TABLE 5

Location	California	Other	Both
Sample size	1286	744	2030
MEAN ES	.29 (3)	.16	.24
ES Variance	.008	.005	.01
Error Variance	.004	.004	.004

(Outliers are in parentheses)

Figure 4 shows the percentage of studies on the gifted group and the corresponding location of those studies.

Location of Research
FIGURE # 4

Location of Gifted Populations in Published Studies

Legend:
- journals
- monographs
- conference
- microfiche
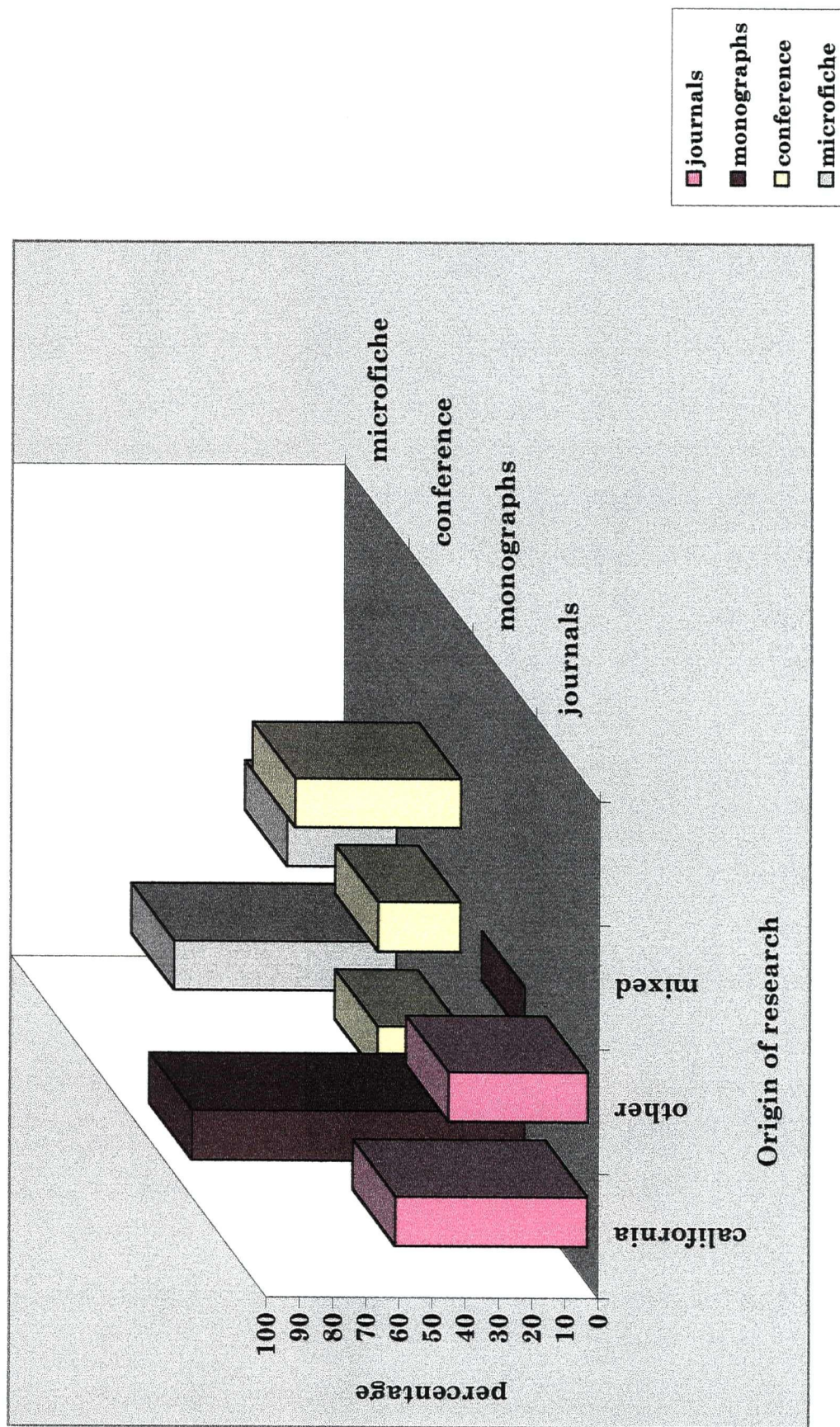
EDUCATIONAL ASPIRATIONS

The desire for success or an individual's educational aspirations has been investigated within the gifted studies on life satisfaction. Thus it was included as a possible moderating variable. Educational aspirations were included in 5 studies on life satisfaction. The corrected mean effect size was .27. Prior to the overall ES calculations, outliers were detected and removed from the analysis. The variance across studies was .005 and the error variance was .003. All effect size estimates were positive, and they ranged from .16 to .35. Although the relationship between the way gifted individuals feels about their educational aspirations and their life satisfaction is existent, it is not a strong effect. Therefore, any interpretation should be made with caution.

__SUMMARY__

This chapter covered the results of the various aspects of gifted individuals' life satisfaction using a meta-analytic approach. After providing an overall effect size, we examined the influence of separating the various characteristics of the sample, special schools, and several aspects of overall life satisfaction, such as occupational and life satisfaction on the ES estimates. The results were given of possible moderating variables. The data indicate that there is a positive though very weak relationship between overall satisfaction and giftedness. Additionally, special school programs show a positive although weak relationship with satisfaction of the gifted.

Chapter 5 opens with a discussion of the findings of this meta-analysis. These are further discussed as they relate to some of the issues addressed in Chapter 2. Additionally, a discussion of some of the strengths and weaknesses in this paper will be presented.

CHAPTER 5

DISCUSSION

This chapter discusses the findings of the meta-analysis on the life satisfaction of gifted individuals. The section begins with an examination of the source characteristics and how these may influence the overall results. It also includes a discussion of the varying methodologies employed in the studies and the differing characteristics of the participants included in the research. This is followed by considering the overall relationship between gifted individuals and life satisfaction. Consequently numerous identified variables are evaluated as they pertain to the differing study outcomes. Also included in this chapter is a discussion of the findings on gifted school programs.

The second section begins with an examination of how the results relate to the issues raised in Chapter 2. These issues include the continuing controversy over a definition of intelligence and a satisfactory method to

identify giftedness. Included with this is a discussion of the current assessment methods used to determine life satisfaction.

The third section reviews some of the strengths and weaknesses in the current paper and in the research.

Finally, the fourth section outlines some of the implications of the findings on gifted individuals' life satisfaction. Furthermore, there are recommendations for the direction that further research in the area of gifted and gifted school programs should take.

SOURCE CHARACTERISTICS

Study Characteristics

The importance of investigating every aspect or influence in a given study is made inherently clear by a meta analysis such as this one. Certain trends and accepted practices can be uncovered that may demonstrate influences that alter the results. If these characteristics are categorized and combined, it is possible to attribute the cause to differing variables in the research. In the investigation of the life satisfaction of gifted many variables

were isolated and combined to determine their possible influence on the results. The first area for consideration was the source characteristics. In the findings 60% of the research used in this paper came from journals and only 10% came from unpublished work. The second variable of interest came from the population itself. More than 47% of the sample used in the entire meta-analysis originated from the Terman group of the 1920s. In addition, the majority of the data in the studies came from studies done more than twenty years ago. Less than 11% of the data came from recent samples and none of the research originated outside of the US. Even more interesting was the observation that the majority of the research on the gifted came from California. This preponderance of research from such restricted sources indicates that more research farther afield is certainly in order.

Of the 19 studies that met the original criteria, many used statistics that were untranslatable or did not provide enough data to replicate the study. Very few of the researchers had first hand contact with the samples they were studying; many had relied on data provided from existing research.

Methodologies employed

There were a number of interesting findings observed by categorizing the methodologies employed in the research. These included variables such

as the overwhelming reliance on the Stanford Binet as the method of identification of the gifted. Although this is considered a reliable test, not one of the research papers employed the WISC, and only a handful adopted other methods to identify IQ or giftedness. Furthermore, three of the papers did not identify the actual method of classifying the individual as gifted.

Concerning the measurement scales used to identify an individuals life satisfaction, little information was provided in the studies. Thus this variable was difficult to evaluate. Considering the plethora of scales available with high levels of reliability and validity, it is unfortunate that these scales are excluded in the studies of the life satisfaction of the gifted. The majority of the methodologies employed were second hand interpretations or interviews with the researchers. Consequently, this item was removed as a categorizable variable.

Participant characteristics

This area categorized the age, number of participants in the study, the sex, the IQ of the gifted, and whether the group was part of the Terman sample. As previously discussed, almost half of the studies in this meta-analysis used individuals from the Terman group. Additionally identifying

the level of giftedness varied immensely across studies. The lowest IQ level that is acceptable in this meta-analysis is shown in the appendix under participant characteristics. Additionally, the effect sizes with corresponding IQ scores are presented in Appendix 5.

In summary, the importance of categorizing the source characteristics from each study becomes inherently clear in a meta-analysis. It demonstrates how variables within a study can cause variation in the findings. Further, it helps elucidate some of the weaknesses in the research and the need for more varied samples.

Special School Programs for the gifted

Schools and programs created a conundrum of problems. On initial investigation of the literature, numerous articles retrieved condoned specialized programs. Unfortunately many of these schools claimed success too early for the purposes of this meta-analysis. Thus many were discarded. The second problem pertained to the length of time the programs lasted. Few programs remained in existence for more than a couple of years. Many lasted less than 6 months. Additionally, many classified themselves as gifted programs but provided only career counseling. Identifying the characteristics

of the school programs not only identified nuances in their different philosophies (This made it difficult to determine if trends or styles in teaching gifted are more or less effective) but it also disclosed weaknesses in the research on the schools or programs long term efficacy. As a result this meta-analysis demonstrated a necessity for accountability in many of these programs.

In their meta-analysis on acceleration and specialty programs, Kulik and Kulik (1982) found that individuals felt very satisfied with the programs. The finding of the current meta-analysis, using a much greater time span from start to follow-up, was not nearly as strong. Further research over a longer period of time would be beneficial. Perhaps as observed by Janos (1987), the long term effects of gifted school programs tend to disappear with time.

Life Satisfaction Overview

Qualitative research presents the gifted population as a self-assured, successful, well-adjusted group (Tannenbaum, 1987; White, 1987). The assumption would be that they enjoy a good sense of their own self worth and generally have a high level of satisfaction. Terman (1925) found this group much less prone to psychological problems including mental illness and

criminal behaviour (Oden, 1968; Tannenbaum, 1992). These narrative reviews create the impression that gifted individuals are thoroughly satisfied with their lives. Consequently a strong positive relationship should exist. In the current meta-analysis, the overall relationship between giftedness and satisfaction was only .14 . Although this result is positive, it is not at all indicative of a strong relationship. To determine if other variables might account for irregularities across studies, or serve to decrease or increase the mean effect size, the influence of possible moderating variables was examined. The following is a discussion of the breakdown of some of these variables.

To begin with, satisfaction with life was divided into two key variables and the findings were separated accordingly. The first was life satisfaction and the second was vocational satisfaction. The relationship between life satisfaction and giftedness was statistically significant, but weak. The second variable, vocational satisfaction, provided a slightly more positive result, but it remained weak.

Life Satisfaction

The life satisfaction of the gifted population is definitely not as strong as previously predicted. Little life satisfaction was observed and this maintained itself across numerous variables. Men showed slightly more life satisfaction than women, .3 for men compared to .13 for women. Although Terman's group is involved in more than half of the findings, the evidence of life satisfaction remained weak. A stronger life satisfaction effect is observed only when the early work of Terman is considered exclusively. These early findings of Terman proved a stronger effect than any other group.

The effect of age on the relationship of satisfaction to giftedness

A positive relationship was observed between giftedness and life satisfaction for the two younger age gifted groups. However, a negative relationship emerged for individuals over 41 years of age. Of the three groups, only the middle age group reached significance at the .05 level. As previously referred to by Sears (1977) changes occur in later life that may affect mens' perception of life satisfaction. Sears (1977) found that gifted men judged income to be important through their early years in determining

vocational satisfaction. However, this changed as they matured and family and home life became more crucial.

Vocational Satisfaction

The second major division of satisfaction was vocational satisfaction. Effect sizes in this area were all positive. These findings vary little from the findings on life satisfaction. Men demonstrate more work satisfaction than women, and California appears to offer more vocational satisfaction than other parts of the country. Additionally, whether the gifted group felt they lived up to their educational aspirations was observed as a moderating variable. Although the studies were limited in their scope, the mean effect remained positive. Unfortunately none of these results were strong enough to make a clear interpretation. Certainly in comparison to the strong findings of Terman, these results suggest further investigation is needed and that the gifted group are no happier than the general public.

Terman Studies

The mean effect size of the Terman population compared to other populations across the country was positive Although this was higher than

the other gifted samples, the variation across studies was very small, after the mean was corrected for sampling error.

Three studies emerged reviewing the early works of Terman. These found a moderately strong relationship between life satisfaction and an individual's giftedness. The principle difference between these studies and others was that they were retrospective and the interviews were conducted by only the Terman team. In the early works of Terman (1925), many of the files indicate that the author spent copious amounts of time with his subjects and gave them much encouragement. This may be why this group show the higher mean effect size (r= .38). Perhaps the Terman group needed to live up to the expectations of their mentor or their new found notoriety, a self fulfilling prophecy.

Of particular interest in the Terman sample was the observation on the relationship of giftedness to satisfaction in individuals that scored over 180 IQ, as compared to individuals who scored in the range 130 to 150 IQ. According to the findings of Feldman (1984), the higher the IQ the less satisfied with life women feel. In this case, the effect size estimate was negative. Unfortunately, little research exists apart from the Terman group on this topic. Although when the effect sizes observed in Appendix B the

higher IQ scores of 147+ show some of the lowest effect sizes. Moreover, four of the five negative effects sizes for life satisfaction were from this higher IQ group.

Gender

Men and women revealed little difference in their life satisfaction, but larger discrepancies occurred in occupational satisfaction. Any quantitative interpretation of life satisfaction is difficult due to the large standard deviation for men and the limited number of studies found in the literature addressing men's life satisfaction. Occupational satisfaction, however, demonstrated a stronger effect. Men, it seems, enjoy more occupational satisfaction than women.

In summary, it appears from this meta-analysis that the relationship between life satisfaction and giftedness, although positive, is not as strong as previously considered. Neither does it appear to vary greatly across situations, gender, or location. Only the Terman studies appear to have a moderately positive conclusion. The importance of the Hunter and Schmidt methodology demonstrates that sampling error may be the primary source of variation observed in the literature.

Undoubtedly, due to the limited number of available studies on men there is a need for more research in the area of men's satisfaction.

A discussion of the Current Issues in the Research

The pressure to succeed for those who are gifted is immense and the results of this meta-analysis indicate that their feeling of satisfaction with their lives is not as great as previously thought. Perhaps these individuals labour under the strain of not living up to all of society's expectations. Conceivably, this belief may affect self perception, and cause an overall lowering in one's feelings of worth and esteem.

Gifted youths with lowered self concept and a corresponding lower achievement are referred to as underachievers. Gifted underachievers create a unique and challenging problem in research. They are often apathetic and afraid of failure. Terman's work did not acknowledge this aspect of the gifted. Indeed, he identified the gifted as highly motivated, successful and excelling in all areas of academic and social responsibility.

Unfortunately, underachievers continue to be a complex group to study and categorize in a meta-analysis and the innumerable variables that affect them are well beyond the scope of this paper. However, the idea that underachievers exist obligates the researcher to rethink the concept of giftedness and the current process by which it is identified. The view that intelligence is a unitary construct may cease to be a valid concept. This work acknowledges that to be gifted does not presuppose that such individuals will be happy and satisfied with their lives. It is clear from the present study that IQ tests are indicative only of an individual's ability to be successful at school.

Accordingly the present findings show that only a small percentage of the gifted view themselves as satisfied with either what they have attained, the school program they attended, or the vocation they have chosen. We must consider the possibility that our expectations for the gifted are too lofty or our current unitary definition of intelligence is inaccurate.

The reality that many gifted do not live up to their own or society's expectations opens the way for a broader or more encompassing view of intelligence. The multi-dimensional view of intelligence and Sternberg's Triarchic view are just two of the more widely accepted alternate theories.

Unfortunately, in Sternberg's conceptualization we are not provided with a methodology to identify intelligence or gifted individuals. With the current morass of criteria that this theory requires a researcher to sift through, the possibility of having a concise methodology in the near future is unlikely. However, the importance of the triarchic theory can not be overlooked, as its multifaceted nature stands in contrast to the narrow and limited scope of the contextually bound IQ test. Currently the Stanford Binet is the principle identification method for the gifted and as such was the principle method used for the studies in this meta-analysis. Should the triarchic theory evolve a viable methodology to identify intelligence it would provide an interesting differential identification process and a moderating variable in a meta-analysis.

Like Sternberg's triarchic theory the MI theory has not provided fertile ground for applicable research. Although this theory is well cited in the literature, as a practical and probable hypothesis, its popularity lies in its ease of understanding with the lay community.

Gardner (1991) advocated that an individual's intelligence be tested through a more multifarious method. Some of the IQ identification methods outlined by Gardner were reported in this meta-analysis.

Unfortunately, the number of studies was too few and varied. Consequently, they did not yield an effect size estimate or a categorizable characteristic.

There are a number of salient features that make Gardner's MI theory represent a more holistic approach. These features may qualify the weaker effect sizes currently observed among the gifted. Unlike Sternberg, Gardner's MI theory considers the internal make-up and the influence of the neurological components on the individual in its measure of intelligence. Additionally, it is a 'common sense' approach that deals with all aspects of the individual.

In summary, with time and clarification of a methodology, including a more diversified theory of intelligence, the findings of a similar meta-analysis may be quite different.

Strengths and Weakness in the Literature

The importance of a meta-analysis when there is such a prolific amount of literature on a topic is self evident. Without a systematic

categorization of variables within each study it is difficult to make sense of the differing results, when essentially each claims to be studying similar issues. It also indicates where more research may be needed.

In the current meta-analysis on life satisfaction there were a number of strengths and weaknesses. Many of these were not readily observable until grouped or categorized into a coherent summary. These provided for an interesting analysis.

To begin with, the date of publication of a study did not relate to the actual time when the research was undertaken. Many of the studies extracted data from previous research, such as that of Terman and associates. As previously discussed in chapter two, Terman's work is from much earlier on in this century and many questions have arisen as to the objectivity of the researcher then.

A second important consideration pertains to the sample source. Although the original sample of Terman's would be classified as large (n=1500) it is impossible to ascertain which portion of the Terman sample each study included. It is conceivable that the same group of gifted are used in each of the nine studies that drew data from the Terman group. The

effects on the meta-analysis results are difficult to ascertain and as yet Hunter and Schmidt do not provide a process to correct this.

Other problems in the studies were unearthed by a meta-analysis. There was a fundamental weakness in the research methodology. There were no pretested self-concept scales used in any of the studies. Some authors created their own measures but these were few and far between. This was apparent when we tried to investigate the type of scale used to identify life satisfaction as a moderating variable. The information provided by the researchers was sketchy. This lack of a reliable measure confirmed that many assumptions were being made by the researchers. Particularly concerning the reliability of the scales used.

A further weakness encountered in this meta-analysis was the lack of original research. Many of the papers used re-use their subjects and it is impossible to tell which subjects are employed more than once. This lack of independence creates a methodological flaw that could easily be corrected by more original research on new groups of gifted. Although 41 effect size estimates were ascertained from the literature, there are only 19 studies included in the entire meta-analysis. Additionally, of the 19 studies nine use

the Terman population of the 1920s. Thus, as previously mentioned, each of the nine studies could be using the same sample of gifted individuals.

Conclusions and Implications for further Research

The finding that the life satisfaction of gifted individuals is not as strong as previously considered by some rearchers demonstrates the importance of categorizing characteristics within each study. The categorization of the variables has not only identified many possible resasons for the variation across studies but it has also emphasized the lack of change that has occurred in the identification methods of the gifted.

There are a number of important points to be drawn from this meta-analysis. First, it demonstrates that much of the existing research is far more limited in its scope than previously thought. The literature on the long term efficacy of gifted programs is quite sparse.Providing a six to two year program which later folds and then inquiring of the participant as to whether they found the program satisfying is hardly evidence for success of the program or the student. Consequently, because of the long term parameters set out in this research many of the studies initially identified as relevant

had to be discarded. More research is needed on the long term effects of many of these programs.

Although many of the recent studies proposed unique methods to identify the gifted, they fell short in their description of those methods and inevitably continued to employ the traditional Stanford- Binet as a measure of intelligence. Even the WISC-111 and it's earlier counter part, the WISC-R, is noticeably absent in the gifted literature. The total domination by the Stanford-Binet when other methods exist and when the traditional IQ test comes under scrutiny is difficult to comprehend. Although this was not the primary goal of the meta-analysis, this observation served to identify researcher's methodologies and suggest that alternative procedures should be found to identify intelligence.

It was noteworthy that a number of narrative reviews and case study papers reported on a preponderance of academics and teachers among the gifted. Careers were not reported statistically in this meta analysis. Perhaps the proposal that scoring high on a standard IQ test, may be indicative of a career as an academic. The overall success proposed by Terman, utilizing a unitary testing procedure, such as the Stanford Binet, perhaps is overstated.

The definition of what constitutes giftedness in an individual is not always clearly defined in many of the studies. Some studies include 115 IQ on the Stanford-Binet while others use 130+ and finally some define genius at over 135 IQ. This was not a variable that was explored, although it points to inconsistencies in the definition and cut off levels of giftedness.

Furthermore, the Stanford-Binet IQ test, which remains the most widely used measure, is an updated version of a measure originally developed by Terman and Binet in the 1920s. Certainly, legal limitations decry its use at the low levels of intellectual identification. Unfortunately, little dispute occurs at the upper levels of the intelligence scale. Schools, parents and researchers remain quick to call for its use in the labeling of the gifted.

The need to observe and provide enriched environments for the gifted to maximize their potential is not a new concept. The issues raised by this meta analysis demonstrates weaknesses in the gufted's treatment. As a result, there is a necessity of finding new groups of gifted to study and it is important that we do not continue to rely on studies that are out dated and over utilized, such as those in the Terman research.

During the 1960s and 70's testing students IQ was standard practice in most provinces and states. The wealth of information, 30 years could provide, on long term life satisfaction and special schools is exciting. Perhaps a follow-up of a group of these individuals and the multitude of school programs before the commencement of any new curriculum is in order.

As mentioned in Chapter 2, schools such as the University of Toronto Schools have been in existence for many years these gifted programs could provide a plethora of information from its past students. This kind of research could resolve a number of issues raised by this paper. Additionally a new sample, not attached to the Terman group but sufficiently large and old enough for investigation would provide a less restricted range.

SPECIAL SCHOOL PROGRAMS

Many Special School programs have come and gone in the past 50 years. Parents, educators, and governments spend millions of dollars setting up and studying how to perfect these programs, but little research exists substantiating their long term benefits. Many of the school programs collapse due to the retirement or death of their originator (White, 1987) This leaves educators and parents confused as to the usefulness of programs. It appears

that programs are unique and grouping them into one, through a meta-analysis, when techniques and styles are so divergent is not an easy process and may not be a viable method to study them.

To study a gifted individual's life satisfaction it is important to gain an understanding of the many aspects that make up the term life satisfaction. For the purposes of this paper, satisfaction with one's life required a longitudinal investigation of how one feels about themselves after an initial identification of being gifted. Additionally, included in the estimate of life satisfaction was the success one feels at home, work or school over a specified period, a minimum four years. As a result of this broad definition it is important to understand how measuring an individual's self concept/self esteem would play a key role in that life satisfaction. It was my observation that the descriptions and definitions given by the researchers were relatively vague and consensus on the topic was never given. A clearer definition of what constitutes satisfaction with life would help with future research.

In conclusion, clearly chance plays a significant part in any notion of success gifted may have of themselves. Possibly the most daunting obstacle to dealing with chance is that it is unpredictable and hence introduces an element of mystery in forecasting the fulfillment of early promise.

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Appendix A   SOURCE CHARACTERISTICS

Author	Year	Publication	Length	Sample Source
1. Subotnik,	1988	Conference	38-50 years	Terman
2. Subotnik	1988	*	38-50 years	Hunter
3. Subotnik,	1988	*	38-50 years	Hunter and Terman
4. Subotnik	1988	*	38-50 years	Terman and Hunter
5. Oden	1960	Monograph	40 years	Terman
6. Oden	1960	Monograph	40 years	Terman
7. Oden	1960	Monogragh	40 years	Terman
8. Oden	1960	Monograph	4 0 years	Terman
9. Oden	1960	Monograph	40 years	Terman
10. Oden	1960	Monograph	40 years	Terman
11. Sears	1977	Journal	52 years	Terman
12. Sears	1977	Journal	52 years	Terman
13. Sears	1977	Journal	52 yrs.	Terman
14. Rodenstein,	unk	Microfiche	24 -35 years	U. of Wis (Talent)
15. Rodenstein	unk	Microfiche	24-35 years	U of Wis (Talent)
16. Hollinger,	1988	Journal	8 yr.	Project Choice
17. Hollinger,	1992	Journal	14 yr.	Project Choice
18. Hollinger,	1992	Journal	14 yr.	Project Choice
19. Hollinger,	1992	Journal	14 yr.	Project choice
20. .Feldman	1984	Journal	40 years	Terman
21. .Feldman	1984	Journal	40 years	Terman
22. .Feldman	1984	Journal	40 years	Terman
23. .Feldman	1984	Journal	40 years	Terman
24. .Feldman	1984	Journal	40 years	Terman
25. Walker,	1992	Journal	1910- 1970	East Private School
26. Janos	1987	Journal	1936-1977	Terman
27. Englert	1987	Journal	1941-1972	Terman
28. Swaitek	1991	Journal	1972-1991	Wolf Program
29. Tomlinson-Keasey	1990	Journal	60 years	Terman
30. Tomlinson Keasey	1990	Journal	60 yrs	Terman
31. Tomlinson Keasey	1990	Journal	60 yrs	Terman
32. Tomlinson Keasey	1990	Journal	60 yrs	Terman
33. Thomas	1989	Microfiche	4 years	Cal State Talent
34. Holahan,	1985	microfiche	40years	Terman
35. Holahan	1985	microfiche	40 years	Terman
36. Holahan	1985	microfiche	40 years	Terman
37. Powell	1983	Journal	40 years	Terman/mensa
38. White	1987	Journal	30-40 yrs	Speyer School
39. Rusch	1963	unk	3yrs	summer sch.
40. Zha	1986	journal	5yrs	Chinese
41. Heller	1987	journal		Russia

APPENDIX B

PARTICIPANT CHARACTERISTICS

Study #	Age	N#	Sex	Male	Female	IQ	30yrs + or -	Terman
1. Subotnik	38-50	584	both	284	304	135+	+	yes T
2. Subotnik	38-50	156	both	74	82	135+	+	no
3. Subotnik	38-50	386	fem.		386	135+	+	yes T
4. Subotnik	38-50	358	male	358		135+	+	yes T
5. Oden	49yrs.	1025	both	598	437	135+	+	yes T
6. Oden	49yrs	1025	both	596	424	135+	+	yes T
7. Oden	49yrs	975	both	588	387	135+	+	yes T
8. Oden	49yrs	1003	both	599	404	135+	+	yes T
9. Oden	49 yrs	1116	both	613	503	135+	+	yes T
10. Oden	49 yrs	445	fem		445	135+	+	yes T
11. Sears	62 yrs.	224	male	224		135+	+	yes T
12. Sears	62 yrs	189	male	189		135+	+	yes T
13. Sears	62 yrs	151	male	151		135+	+	yes T
14. Rodenstein	24-35	201	fem.		201	unk	mixed	no
15. Rodenstein	24-35	134	fem		134	unk	Mixed	no
16. Hollinger	20-21	108	fem.		108	116+	-	no
17. Hollinger	29 yrs	124	fem		124	116+	-	no
18. Hollinger	29 yrs	126	fem		126	116+	-	no
19. Hollinger	29 yrs	107	fem		107	116+	-	no
20. Feldman	50 yrs	7	fem		7	180+	+	half T
21. Feldman	50 +or-	19	male		19	180+	+	half T
22. Feldman	50+ or-	15	male	15		150+	+	half T
23. Feldman	50 +	11	fem		11	150+	+	half T
24. Feldman	50 +	52	both	18	34	150+	+	half T
25. Walker	20 -70	409	fem.		409	unk	+	no
26. Janos	23-64	38	both	26	12	140+	both	yes T
27. Englert	40yrs	325	fem		325	135+	both	yes T
28. Swaitek	23 yrs	95	both	61	34	unk	-	no
29. Tomlinson	50 yrs	397	male	397		147-149	+	yes T
30. Tomlinson K	50 yrs	316	fem		316	147-149	+	yes T
31. Tomlinson K	50 yrs	397	male	397		147-149	+	yes T
32. Tomlinson K	50 yrs	316	fem		316	147-149	+	yes T
33. Thomas	13-18yrs	100	both	unk	unk	unk	-	no
34. Holahan	30+	93	both	46	47	135+	30+	yes T
35. Holahan	30+	101	both	47	54	135+	30+	yes T
36. Holahan	30+	47	fem		47	135+	30+	yes T
37. Powell	20-70+	810	both	377	422	135+	mix	half
38. White	60+	8	both	4	4	180+	30+	no
39. Rusch	unk	kulik	both	unk	unk	unk	-	no
40. Zha	5-20yrs	8	both	unk	unk	135+?	-	no
41. Heller	-20	unk	both	unk	unk	135+	-	no

APPENDIX C

METHODOLOGIES EMPLOYED

Study #	Results	IQ test	Sp. Sch.	L,M,S	Pre1960	Location	Sex	Statistics
1#	mail out	SB	no	large	pre	California	both	means
2#	mail out	SB	yes +	med	pre	other	both	means
3#	mail out	SB	yes+	med	pre	mixed	fem.	means
4#	mail out	SB	yes +	large	pre	mixed	male	means
5#	mail out	SB	no	large	pre	other	both	percentages
6#	mail out	SB	no-	large	pre	California	both	percentages
7#	mail out	SB	no	large	pre	California	both	percentages
8#	mail out	SB	no	med	pre	California	both	percentages
9#	mail out	SB	no	med	pre	California	both	percentages
10#	mail out	SB	no	med	pre	Cailfornia	fem	correlations
11#	mail out	SB	no	med	post	California	male	correlations
12#	mail out	SB	no	med	post	California	male	correlations
13#	mail out	SB	no	med	post	California	male	correlations
14#	mail out	unk	no	med	post	other	female	X_2
15#	mail out	unk	no	med	post	other	female	percentages
16#	per. contact	other	yes	med	post	unk	female	f test, corr.
17#	per. contact	other	yes	med	post	unk	female	proportions
18#	per. contact	other	yes	med	post	unk	female	proportions
19#	per. contact	other	yes	med	mixed	California	yes	proportions
20#	mail out	SB	no	small	pre	unk	female	proportions
21#	mail out	SB	no	small	pre	California	females	proportions
22#	mail out	SB	no	small	pre	California	males	proportions
23#	mail out	SB	no	small	pre	California	males	proportions
24#	mail out	SB	no	small	pre	California	males	proportions
25#	mail out	unk	yes	med	pre	other	females	proportions
26#	unknown	SB	yes-	small	pre	California	both	McNemar Q
27#	unknown	SB	no	med	pre	California	female	correlation
28#	mailed	other	yes-	small	post	Baltimore	both	means
29#	mailed	SB	no	med	pre	California	both	correlations
30#	mailed	SB	no	med	pre	California	both	correlations
31#	mailed	SB	no	med	pre	California	both	correlations
32#	mailed	SB	no	med	pre	California	both	correlations
33#	mailed	other	yes	small	post	California	both	?
34#	mailed	SB	no	small	pre	California	both	corr. /means
35#	mailed	SB	no	med	pre	California	both	means
36#	mailed	SB	no	small	pre	California	female	t test, means
37#	mailed	SB	no	med	pre	both	both	X

38#	unk	SB	yes	small	pre	New York	both	unknown
39#	interview	unk	yes	unk	post	unk	both	ES
40#	interview	unk	yes	small	post	other	both	?
41#	unk	unk	no	large	post	other	both	?

Appendix D

EFFECT SIZE ESTIMATES:

Study #	diff./ sex in Life Sat.	diff/ sex in Vocat. sat	Life Sat. ES	Ed. fufilled ES=	Homemaker vs Career	Special vs non-Special school	Occup Sat. ES
1. Subotnik	.02						
2. Subotnik	.14						
3. Subotnik			.19			.19	
4. Subotnik			.32			.32	
5. Oden		.09					
6. Oden		.08					
7. Oden		.07					
8. Oden		.12					
9. Oden	.07						
10. Oden					.01		
11. Sears#1				.16			
12. Sears#2			.46				
13. Sears#3							.58
14. Rodenstein			.05				.31
15. Rodenstein					.07		
16. Hollinger			.21			.21	.20
17. Hollinger				.25			
18. Hollinger							-.01
19. Hollinger			.11			.02	
20. Feldman			-.08				
21. Feldman			.25				
22. Feldman			.08				
23. Feldman			.20				
24. Feldman	.05						
25. Walker			.12		.12		
26. Janos						???	
27. Englert			.25	.21			.39.
28. Swaitek			-.26			-.26	
29. Tomlinson				.35			.30
30. Tomlinson				.33			.20
31. Tomlinson			-.19				
32. Tomlinson			-.10				
33. Thomas				.002			
34. Holahan		.65					.29
35. Holahan	.11		.28				
36. Holahan			-.01		.27		
37. Powell						.	
38. White							
39. Rusch						.80 (K)	
40. Zha	China						
41. Heller	Russia						

(K)= Kulik and Kulik existing Meta-analysis

IQ
APPENDIX E

Effect sizes of studies and their corresponding IQ